LITHOGRAPHIC ABSTRACTS 1951

Monthly Lithographic Abstracts
September, 1950 through July, 1951

LITHOGRAPHIC TECHNICAL FOUNDATION, INC.

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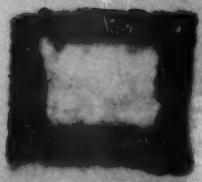

ERRATA

LITHOGRAPHIC ABSTRACTS—1951
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In the following abstracts listed in this publication, all source references given as "Printing Abstracts" should read "Photographic Abstracts":

Page 5, Col. 1: Photographic Methods for Producing Reticules

Page 8, Col. 2: Photoelectric Half-Tone Reproduction

Page 12, Col. 2: Recording Colour Densitometer

Page 17, Col. 1: Combined Printing and Whirling Device

Centrifugal Emulsion Coating Machine

Page 24, Col. 1: Production of Planographic Printing Plates

Page 52, Col. 1: Aluminum Supports for Photographic Emulsions

Col. 2: Method of Treating Aluminum Surface

Source reference should be "Chemical Abstracts, Vol. 44, No. 18, September, 1950, Column 8675" for:

Page 17, Col. 2: The Question of Substitutes in Offset Copying

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LITHOGRAPHIC ABSTRACTS are published monthly in the trade press. Because of the exigencies of magazine publication, a complete set of abstracts cannot be had from one source. For this reason, and for the convenience of the lithographic industry, annual publication commenced with the 1947 issue. The months *September 1950* through *July 1951* are included in this issue. Plans are underway to publish Lithographic Abstracts prior to 1947.

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Photographic Equipment and Methods

PHOTOGRAPHIC METHODS FOR PRODUCING RETICULES. C. Leistner. *Photographic Engineer* 1, 1950, Pages 7-15. The important requirements for the production of reticules for use as scales in optical instruments for precision measurements are discussed. Photographic processes for this purpose are critically reviewed, and some of the problems of future development are considered. *Printing Abstracts*, Part 1, 1951, Page 41.

*THE OPEN-AIR CONCENTRATED-ARC LAMP. W. D. Buckingham. *Journal of the Society of Motion Picture and Television Engineers* 54, No. 5, May, 1950, Pages 567 84 (18 pages). The open-air concentrated-arc lamp is a new form of the concentrated arc which operates in the open air and does not require any enclosing bulb or protective atmosphere. The light source is a sharply defined, circular spot which is formed on the end of the electrode by a thin film of incandescent molten zirconium. The lamps can be operated from alternating or direct current and can be made in sizes up to several kilowatts. A 1-kw lamp operating on alternating current draws 18 amp at 55 v and produces 3000 candlepower from a spot 5.4 mm in diameter whose average brightness is 130 c/sq mm. The radiation has a continuous blackbody type of spectral distribution and a constant color temperature of 3600 K. Due to a unique operating principle whereby the zirconium metal is constantly renewed from its own products of combustion, the lamps can have lives of several hundred hours. The exhaust products are nontoxic and the electrodes are replaceable. The lamp is characterized by extreme stability and ease of operation. It is expected to find application in projection, television, flood and spot lighting and other fields which require intense light sources.

AVOIDING GUESSWORK IN MEASURING COLOR DENSITIES. *Photographic Trade Bulletin* 11, May, 1950, Page 363. The E.E.L. Universal Densitometer, made by Evans Electroselenium Limited, for measuring color densities has a liquid-tight removable top which permits measurements to be made on wet materials. Three apertures are provided of 1-, 2-, and 4-mm. diameter. Density ranges of 0 to 1, 1 to 2, and 2 to 3 are covered. A reflection head that may be connected to the instrument is said to be useful for measurements of maximum density of flat color originals in calculating densities of magenta or other color-correction masks. It may be applied especially in the photoengraving industry. By using color filters, the instrument may be used as a color comparator, making possible direct readings of reflection density from 0 to 2. Two models of the densitometer are available, one taking negatives up to 12 inches in width (of any length), and the other taking negatives up to 24 inches in width. *Monthly Abstract Bulletin* 36, No. 8, August, 1950, Page 369.

COPY HOLDER FOR CAMERAS. Victor Sussin. *Official Gazette* 638, No. 4, September 26, 1950, Page 1159. *United States Patent Number 2,523,735*. A copy holder of the character described and provided with a positive curtain assembly, said curtain assembly including, in combination, a lower shade, an upper shade, and a shade toward each side of the copy holder, said lower and upper shades being adjustable vertically to define the elevation and vertical dimension of the light opening presented through the copy holder, and the side shades being vertically extensible and adjustable bodily laterally toward and from each other to define the width of said light opening.

* THE MULTICHROM CAMERA. W. B. Hislop. *Process Engravers Monthly* 57, No. 683, November, 1950, Pages 325-6 (2 pages). A process camera designed primarily to produce color-corrected and

multiple-image positives has been developed and put into production. The instrument, called Multichrom Camera, is based on two principles, first that it is mechanically possible to replace plane objects exactly; second that the path of light through an optical system is reversible. The camera accommodates both opaque and transparent copy. It is essentially a camera within a camera with a single lens system. To make a mask a regular exposure is made then the negative is replaced in its holder and illuminated. An exposure is made through the same lens to a quarter plate producing a positive mask. This mask is then replaced in its holder and a sensitized plate placed in contact with the negative in its holder. An exposure is made through the combined mask and negative to produce the corrected positive. Inserts of lettering, borders, etc. can be made simply by multiple exposures.

• A DIRECT-READING EQUIVALENT DENSITOMETER. A. F. Thiels. *Society of Motion Picture and Television Engineers*, 56, No. 1, January, 1951, Pages 13-22 (10 pages). The definition of equivalent density of a primary color of a multilayer color film is given and a direct-reading photo-electric equivalent densitometer is described. The method of operation of the instrument is explained and the basic features of the electronic circuit and the optical and mechanical layouts are given. The apparatus has made it possible to make direct measurements of the density of any one primary color of a color film without being affected by the presence, if any, of other primaries.

CAMERA. Victor Sussin. *U. S. Patent 2,551,181. Official Gazette* 646, No. 1, May 1, 1951, Page 220. In a camera, in combination, a frame, a scale mounted on the frame, a board mounted on the frame for movement longitudinally of the scale, a housing, means connecting the housing to the board, a dial indicator mounted on said housing, a pointer slide movably supported on said housing, the pointer of said slide being operatively associated with said scale, and means connecting the pointer slide and dial indicator whereby movements of the pointer slide are registered on the indicator.

PHOTOGRAPHIC TYPE COMPOSING MACHINE. Herman R. Freund and Fritz Stadelmann. *U. S. Patent 2,552,881. Official Gazette* 646, No. 3, May 15, 1951, Page 855. Apparatus for photographically producing on a sensitized surface a line of type matter by photographing individually character-bearing elements composed into a line, in combination, a channel for supporting a composed line of elements an abutment against which the leading element of said line is adapted to be positioned, element-removing means movable progressively in one direction and including a series of spaced pawls for engaging and moving successive elements singly from the leading end of the line to a photographing position, photographing means, line-follower means movable from a starting position in steps proportioned to the thickness of each element as it is removed, a drive including a clutch, clutch-operating mechanism operative to connect said drive to drive said element-removing and photographing means for a limited period and in timed relation with arrival of the elements for removal and photographing, releasable stop means holding said follower means at a starting position and operative upon release thereof to condition said clutch-operating mechanism to connect said drive, and means operated by said line-follower means in response to the removal of the last element to condition said clutch-operating mechanism to disconnect said drive.

PHOTOGRAPHIC COPYBOARD. John D. Maxwell. *U. S. Patent 2,554,712. Official Gazette* 646, No. 5, May 29, 1951, Pages 1540-41 (2 pages). 1. A photoengraver's copyboard including in combination a base, a pair of frame members hinged together along one edge and

also mounted for pivotal movement on said base from a horizontal loading position to a vertical exposure position, and automatically acting latching means for releasably holding the copyboard in its horizontal position comprising cooperating hook members, one on a pivoted frame member and one on the base engaged by movement of the frame members to horizontal position, and hook releasing means mounted on said pivoted frame member and actuated by the closing movement of the hinged frame members.

ATTACHING MEANS FOR MASKING STRIPS. Joseph Isaac and Arthur C. Rissberger, Jr. *U. S. Patent 2,544,883. Official Gazette* 644, No. 2, March 13, 1951, Page 472. In a photographic printing apparatus, the combination with a printing surface formed with a slot, of a masking strip slidably positioned on said surface, and a bowed resilient section formed on said strip and extending through said slot, said section having a portion of minimum width which prior to insertion in said slot is greater than the normal width of said slot so that said portion when positioned in said slot will engage the edges of said slot yieldably to connect said strip detachably to said apparatus and to position said strip in a definite angular relation to said slot.

* LIGHT MEASURING INSTRUMENT. *Industrial Laboratories* 2, No. 6, June, 1951, Pages 16-17 (2 pages). Claimed capable of registering light as low as .0001 of a microlumen, the line operated "Photovolt Multiplier Photometer" incorporates an electron multiplier tube as the light-sensing element. Light falling on the instrument's cathode is converted by the multiplier tube into an electron current, which is then successively multiplied within the tube by secondary emission of each of 9 electrodes—so that current output is thousands of times higher than that of conventional phototubes. Output is further boosted by high-gain two-stage vacuum tube amplifier, and is registered on long-scale indicating meter. Resulting high sensitivity is claimed to make possible reliable measurement, extremely low light values; also evaluation of very thin pencils of light within narrow spectro bands as required, for instance, in color densitometry and spectrophotometry.

Tone Reproduction

* INFRARED — PREDETERMINING THE QUALITY OF INFRARED NEGATIVES. David O. Johnson. *Modern Lithography* 18, No. 8, August, 1950, Pages 36-8 and 95, 97 (5 pages). Black printer negatives can be made on infrared film with varying photographic qualities. The main difficulty has been the predetermination of how a piece of copy will photograph. However, by utilizing a wartime device, the "snooperscope", in a specially constructed viewer the photomechanical craftsman can predict the quality of the camera negative. Wiring and assembly diagrams of the viewer are given with detailed instructions.

* LENS FLARE AND CAMERA REFLECTIONS. Herbert P. Paschel. *Lithographers Journal* 35, No. 5, August, 1950, Pages 8-9, 41 (3 pages). The author gives a resumé of seven factors which affect flare and how to minimize them.

* TONE REPRODUCTION IN HALFTONE NEGATIVES. J. A. C. Yule. *Modern Lithography* 18, No. 9, September, 1950, Pages 61-4 and 135, 137, 139 & 141 (8 pages). Tone reproduction diagrams are useful in detecting halftone distortions and in calculating changes that should be made in any single step if the others are kept constant. In a step-wise quantitative analysis of the effect of a non-image (flash) exposure and an image exposure a useful tool for re-

search on the shape of the tone reproduction curve is evolved. This analysis is applied to other exposure combinations such as two image exposures with and without the halftone screen. While the calculations and analysis in the article are based on observations on negatives made with the magenta contact screen, they can be easily applied to glass screen negatives. This method of analysis was the basis of a study of contrast and density range in halftone work. From this evolved a means of exposure control, an exposure computer, which allows the prediction of detail exposure. By a slight modification of the computer the flash exposure required for an original of any density range can be calculated. This stepwise analysis opens up the possibilities of investigation of reciprocity failure and developer edge effects.

* TIPS ON CAMERA. Harry Shaw. *National Lithographer* 57, No. 9, September, 1950, Pages 36 and 102 (2 pages). There are several means of highlighting halftone negatives—using special copy, making additional exposures, and by hand retouching.

THE COLOUR TEMPERATURE OF LIGHT SOURCES. H. G. W. Harding. *Proc. Phys. Soc.*, 63, No. 9, 1950, Pages 685-98 (14 pages). The definition of colour temperature is explained and the approximations of the spectral distributions of energy of lamps to those of black-body radiators are indicated. The value of colour-temperature measurements to the colorimetrist is outlined and difficulties in making the measurements are dealt with. The use of photoelectric devices for colour temperature measurements are mentioned. Colour temperature is very useful to express the operating conditions of light sources such as tungsten filaments, but should not be used indiscriminately for other light sources, because if the colour and energy producing the colour are different from those of a full radiator, observer differences and minimum perceptible colour differences have to be considered before the value of colour temperature to specify the colour can be assessed. *Printing Abstracts* 5, No. 11, November, 1950, Page 523.

* TONE REPRODUCTION BY HALF-TONE PROCESSES. H. M. Cartwright. *Process Engravers Monthly* 57, No. 683, November, 1950, Pages 336 and 339 (2 pages). This article is an interpretation and criticism of the paper presented by J. A. C. Yule on the subject, "Tone Reproduction in Half-tone Negatives".

PHOTOELECTRIC HALF-TONE REPRODUCTION. Etablissements Edouard Belin. *British Patent 643,330.* The method has for its object the conversion of continuous tone documents into hatched or half-tone images suitable for printing, in particular on fabrics. The original document is scanned photoelectrically as in photo-telegraphy; the amplifier output controls the movement of a galvanometer, the angle of deflection being proportioned to the density scanned. A pencil of light of rectangular cross-section is reflected from the galvanometer mirror on to a rotating opaque disc containing a number of rings of radial slots of constant pitch. The light beam moves radially across this disc through a triangular aperture so that the transmitted pencil consists of a series of light pulses, in which the pulse rate and the pulse space ratio are related to the original density. These pulses are collected by a photocell and amplified, and may be used to print a half-tone image photographically (as in phototelegraphy), or to control an engraving tool to make the half-tone printing block direct. *Printing Abstracts*, Part 1, 1951, Page 39.

* EVALUATION OF DOT SIZE IN HALFTONE. H. M. Cartwright. *Photo-Engravers Monthly* 58, No. 685, January, 1951, Pages 14 & 16 (2 pages). A discussion of the evaluation of dot size and its relationship to reflection density.

TONE CONTROL IN PHOTOGRAPHIC DEVELOPMENT. John A. C. Yule. *U. S. Patent 2,541,490. Official Gazette* 643, No. 2, February 13, 1951, Page 531. The method of producing a photographic masking image in a silver halide emulsion layer, which comprises exposing said layer to an image, developing the regions of greatest exposure of said exposed layer in a developer having the composition:

	Grams
Hydroquinone	22.5
Sodium sulfite	30.
Potassium metabisulfite	2.6
Boric Acid	7.5
Potassium bromide	1.6
Para-formaldehyde	7.5
Water to 1 liter	

to a contrast of the order of from 1 to 6, and immediately, without any fogging of the residual silver halide of said emulsion, further developing said emulsion in a mixture of 1 part of the following composition A with 4 parts of B and 5 parts of water:

A.	p-Diethylaminoaniline hydrochloride ....g....	8.5
	Sodium hexametaphosphate ....g....	8.5
	Sodium sulfite (desiccated) ....g....	42.5
	Potassium bromide ....g....	3.0
	Benzotriazole ....g....	0.25
	Water to make ....liter....	1
B.	Sodium metaborate ....g....	120
	Sodium hydroxide	18
	1-p-nitrophenyl-3-methyl-5-pyrazolone ....g....	36
	Condensation product of formaldehyde and naphthalene sulfonic acid ....g....	5
	Water to make ....liters....	4

to develop silver and dye images to an extent less than required for complete development, in the regions which received less exposure, and removing developed silver and residual silver halide from said emulsion.

*CONSIDERATIONS ON THE FORM OF THE SCREEN DOTS IN OFFSET. E. Schenkel. *Printing Abtracts* 6, No. 1, January, 1951, Page 30. The effect of the form of the dot on the tone reproduction and the respective merits of a round and a square dot for different types of work are briefly discussed.

TONE CONTROL IN PHOTOGRAPHY. John A. C. Yule. *U. S. Patent 2,544,910. Official Gazette* 644, No. 2, March 13, 1951, Pages 478-479 (2 pages). The method of making a negative photographic image having increased shadow and highlight contrast which comprises exposing to an image a silver halide emulsion layer giving a contrast of from 3 to 15 when developed to less than one-fifth its maximum speed in a developer having the composition:

	Grams
Hydroquinone	22.5
Sodium sulfite	30.
Potassium metabisulfite	2.6
Boric acid	7.5
Potassium bromide	1.6
Paraformaldehyde	7.5
Water to 1 liter.	

whose action has been retarded by the addition of one part of the following restrainer to two parts of said developer:

Sodium sulfate (desiccated)	....grams 180
Potassium bromide	....grams 10
Acetic acid (28% solution)	....cc. 32
Water to 1 liter.	

developing said emulsion to a contrast of from 3 to 15 at less than one-fifth the maximum speed of said emulsion, and without fogging residual silver halide developing said emulsion in a second developer giving an emulsion speed of from 5 to 100 times that of said first-mentioned developer and a maximum density between 0.5 and 20.

*TIPS ON CAMERA. H. Shaw. *National Lithographer* 58, No. 4, April, 1951, Page 40. Handy tips on reproducing copy made up of colored overlays on a black and white wash drawing.

PHOTOGRAPHIC DEVELOPERS YIELDING VERY HIGH CONTRAST. Johannes Rzymkowski. *Arhiv Kem.* 21, 1949, Pages 68-84 (in German). Very high contrast, with short toe and shoulder, was obtained with both pos. and neg. type emulsions by exposing them through the base and developing in a strongly alk. tanning developer contg. catechol, NaOH, and KBr at 23-6°. The untanned gelatin in the unexposed regions and that weakly tanned in the toe region progressively dissolve in the strongly alk. soln., thus suppressing the toe and increasing the contrast. *Chemical Abstracts* 45, No. 7, April 10, 1951, Page 2801.

*THE NEW DROPDOT PROCESS FOR HIGHLIGHTING. G. O. Berry, Kemart Corporation and DropDot Corporation. *Photo-Engravers Bulletin* 40, No. 9, April, 1951, Pages 35-39 (5 pages). The DropDot Process can be used on non-fluorescent paper and the artist can work in pencil, crayon, pen and ink, etc. The process requires a special wash black, thinner, correction white, spray solution, and a special blue exposure light.

* "DOG-EARED" STOP CUTS EXPOSURE TIME — IMPROVES HALFTONE DOT FORMATION. George W. Jorgensen. *Modern Lithographer* 19, No. 5, May, 1951, Pages 41, 111 (2 pages). Various stops have been invented to produce better half-tones in a shorter time. The "dog-eared" stop, a square stop with dog-ears added to the corners, can cut exposure time 50% as well as producing a smoother tone gradation. The stop is illustrated in the article and can be easily made from film and cut to fit.

Halftone Photography

* LAMPS AND VARIED STOPS. F. H. Smith. *Process Engravers Monthly* 57, March, 1950, Pages 83-4 (2 pages). It is usual in half-tone negative making to vary the stop with the camera's extension, thus making the exposures constant for any scale of reproduction. Unless the lights are placed wastefully far away from small originals, it is not possible to use constant lamp distances for all sizes of original. A device is described, for indicating lamp angles and distances, which includes a slide-rule arrangement for indicating correct exposure times when these factors are changed. *Photographic Abstracts* 30, No. 119, Part 3, 1950, Page 143.

* FIXED STOP EXPOSURES. F. H. Smith. *Process Engravers Monthly* 57, January-February, 1950, Pages 16 and 48-51 (5 pages). When exposures are made on the process camera at a fixed lens aperture, exposures vary according to the scale of reproduction. Exposure times may be made constant if the distance of the lamps from the copy-board is varied suitably with the scale of reproduction. A table of lamp distances for various scales is given. Devices for indicating the distance and angle of the lamps are described. *Photographic Abstracts* 30, No. 119, Part 3, 1950, Page 143.

* HIGHLIGHT HALFTONES. Herbert P. Paschel. *Modern Lithographer* 18 No. 7, July, 1950, Pages 30-33 and 85, 87 (6 pages). Because the highlight tone area suffers most in lithographic reproduction special treatments are sometimes necessary to improve them. Such treatments are roughly classified into three types; photographic procedures, special copy preparation, and highlight screen methods. In treating halftone negatives photographically in the highlight areas exposure is critical and therefore should be determined accurately. Special stops have been designed to aid in improving the highlight tonal areas of halftone negatives. As a rule these stops are of the off-center variety which enables the light to pass through the screen openings at an angle adding a veil or fog over the highlight. Shifting of the halftone screen allows light to impinge on areas not previously ex-

posed. This affects the highlight areas in such a way as to yield a highlight negative. An indirect method of improving the highlight area is to produce a continuous tone negative with dense highlights and then produce a halftone positive from it. The character of the copy determines the success of such methods.

* HIGHLIGHT HALFTONES. Herbert P. Paschel. *Modern Lithography* 18, No. 8, August, 1950, Pages 39-40 (2 pages). A method is described, by means of which highlight drop-outs, or near drop-outs, can be obtained. The process consists of first making a normal halftone negative, from this making a glossy positive enlargement on contrasting paper; the retouching is done on the print, and the print is then reduced to desired size as a line shot is made.

* HIGHLIGHT HALFTONES. Herbert P. Paschel. *Modern Lithography* 18, No. 9, September, 1950, Pages 56-8 and 159 (4 pages). This installment, third in a series on highlight halftones, deals with special copy - preparation drop - out methods. One method uses a patented solution which is applied to tone areas of the copy and then treated chemically yielding a yellow color. A highlight exposure is made using a blue filter with halftone screen removed thus recording only the untouched areas. Another exposure is made with the screen thru a yellow filter recording the tone areas of the copy. Two other patented methods utilize the fluorescence phenomena. The artist uses fluorescent materials in preparing the copy and the photographer using an ultra-violet transmitting filter, without the halftone screen, makes an extra exposure after having made his regular halftone exposure. Drop-out negatives can be made quite easily and cheaply by using such specially treated copy.

* HIGHLIGHT HALFTONES—PART 4. Herbert P. Paschel. *Modern Lithography* 18, No. 10, October, 1950, Pages 58, 68, & 133 (3 pages). Highlight exposures are made using ultraviolet lights and screened exposures are made with white light. The Duplex screen is a glass screen with magenta translucent rulings. The highlight exposure is made through a filter which transmits only low wave-length (400 μ). This acts as an unscreened exposure. Screened exposure is made without the filter. The Duplex screen can be used on all regular halftone work. Efforts to produce a screen that would produce better highlight rendition have resulted in the Chromatic and Duplex screens. The first was designed for use with the Flurographic Process and consists of dark red transclucent rulings which are opaque to "white" light when used with color blind and orthochromatic films but transmit the ultraviolet rays.

PROCESS OF MAKING HALF-TONE NEGATIVES. Francis E. Wattier. *Official Gazette* 641, No. 2, December 12, 1950, Page 532. *U. S. Patent No. 2,533,650.* A process of making half-tone negatives, which process comprises photographing copy by passing light from the copy, through an approximately square stop aperture and through a half-tone screen of a ratio of aperture width to screen line width substantially less than 1:1; and subsequently photographing the copy on the same sensitive medium by passing light from the copy through a larger approximately square, annular stop aperture the opaque center of which is similar in size and shape to the square stop aperture, and through the same screen, the two exposures being in register, being unequal and made with the diagonals of the stop apertures parallel to the lines of the screen.

* BETTER HALFTONES. David O. Johnson. *Modern Lithography* 19, No. 1, January, 1951, Pages 30-2 and 91, 93 (5 pages). Two new techniques of using magenta contact screens are said to give better halftones. The first method is to follow the main white light exposure with an all yellow light flash exposure

onto the exposed film thru the screen in the camera back. Arrangement of the yellow flash lamp is diagrammed. A second method adds to the first method still development and a second white light flash exposure with screen removed. Both techniques are outlined in the article. Both methods increase the tonal range without adversely affecting the highlights.

METHOD OF HALFTONE REPRODUCTION. *British Patent 648,686.* Printing Arts Research Laboratories, Inc. *Printing Abstracts* 6, No. 3, March, 1951, Pages 103-104 (2 pages). Plates free from screen pattern in the highlights and line work are obtained by photographing an original, the shaded portions of which have been rendered absorbent to ultra-violet light, on to a plate sensitive to both ultra-violet and visible actinic light through a halftone screen, the line elements of which are transparent to ultra-violet light and practically opaque to visible actinic light and the openings of which are transparent to both kinds of light.

Color — General

* COLORIMETRY. D. B. Judd. *U. S. Department of Commerce National Bureau of Standards Circular No. 478,* U. S. Government Printing Office, 1950, 56 pages. The definition of colour as a characteristic of light is given, and the basic principles of its measurement are outlined. Reduction of spectrophotometric data is outlined, and three methods are illustrated by examples. The various methods of direct colorimetry are treated briefly, and a more detailed treatment is given of visual and photoelectric methods of colorimetry by difference from a material colour standard. The most useful collections of material colour standards (Lovibond, Arny, Maerz and Paul, TCCA, Ostwald, Munsell) are described, and the most widely used one-dimensional colour scales (colour temperature, Union, Saybolt) are explained. Five widely used specifications of colour having general application are summarized. *Printing Abstracts* 5, No. 12, December, 1950, Page 557.

* THE REPRODUCTION OF COLOR. Arthur C. Hardy and F. L. Wurzburg, Jr. *Interchemical Review* 9, No. 1-2, Spring-Summer, 1950, Pages 3-12 (10 pages). This first of three monographs on color begins with a short history of color reproduction. The mezzotints of Le Blau are described and how the present color separations were derived from James Maxwell's work with the primary filters. From this work the halftone separation now used in printing today evolved. It was obvious from the beginning that color correction would be needed. With the acceptance of the mixture curves in 1931 by the International Committee on Illumination there is the first attempt to establish limit on color receptance. Hand work is utilized to correct for the shortcomings of the separation negatives. Another means of color correction is the technique of masking. While the results are not perfect color rendering they are a vast improvement over the uncorrected negative. The authors having examined the requirements of the graphic arts processes are attempting to place color reproduction in the printing field on a scientific basis. This article and the following two supplements are a non-mathematical summary of the results of such a program.

RECORDING COLOUR DENSITOMETER. A. Simmon. *U. S. Patent 2,499,039.* A coloured object and its reproduction, either transparent or opaque, are scanned successively with light beams in the three primary colours. The transmitted or reflected light is measured by a photocell and the resulting current recorded, preferably on magnetic tape, so that in all six records are obtained. The records are played back in pairs, producing beam deflections on a cathode ray screen so that the colour densities of object and reproduction can be compared side-by-side. *Printing Abstracts,* Part 1, 1951, Page 32.

* SEMIAUTOMATIC COLOR ANALYZER. Lloyd E. Varden. *Society of Motion Picture and Television Engineers* 55, No. 2, February, 1951, Pages 197-204 (8 pages). A semiautomatic color analyzer is described for rapidly determining the extent of unbalance, or deviation from "type", of a processed color negative or color positive monopack film. A standardized light source, a rotating color filter having three sectors which transmit narrow spectral bands of blue, green and red light, a multiplier-type phototube and amplifier, and a cathode-ray tube are employed. The sweep circuit of the cathode-ray tube is synchronized with the rotating filter wheel so that a horizontal straight-line image is produced when a gray or near-gray density of a "balanced" sample is in the light path. A cathode-ray tube image which deviates from a horizontal straight-line image indicates unbalance in a test sample, whereupon correction filters can be introduced in the light path by means of servomechanism devices to produce a horizontal straight-line or "balanced" condition.

* QUALITY OF COLOR REPRODUCTION. David L. MacAdam. *Journal of the Society of Motion Picture and Television Engineers* 56, No. 5, May, 1951, Pages 487-512 (26 pages). The evaluation of quality of color reproduction poses many complex problems. Optimum reproduction needs to be identified. Since it depends upon the limitations of the reproduction process, as well as upon human vision and judgment, optimum reproduction will probably have to be determined for each process separately. The program is to vary the production controls in systematic manners, measure the resulting color reproduction in the best way known, (e.g., the ICI method at the present time), submit the reproductions to visual judgment, and study the judgment data in comparison with the measurements in order to find significant correlations. The growing experience of such studies of color photography is suggested as a guide. Preliminary estimates of optimum reproduction and of seriousness of deviations may be based tentatively on results of studies of noticeability of color differences and on fragmentary results of studies of color photography. These estimates can be improved as various parts of the program are carried out.

Color—Separation and Correction

* ELECTRONIC SCANNERS FOR COLOR CORRECTION. Frank Preucil. *National Lithographer* 57, No. 7, July, 1950, Pages 34, 35 and 66 (3 pages). The electronic scanner developed by the Interchemical Corporation is capable of producing not only corrected continuous tone color separation negatives but also halftones with a different angle for each color. Color correction for any set of inks is obtained by setting the potentiometers of the blocking circuit according to tristimulus readings taken from the inks. The electronic circuit is designed as a mathematical computer based on three simultaneous equations described by Hans Neugebauer of Germany. By continuously solving these equations at a rate greater than 1000 times per second the scanning operation is accomplished.

* CHROMA-GRAPH PROCESS. Joseph Brauer. *Printing Equipment Engineer* 80, No. 4, July, 1950, Pages 27-8 (2 pages). The Chroma-Graph process which produces color saturated separation negatives has been put into production. The process achieves the high degree of color saturation directly by using special high contrast plates developed in a two solution dye-coupling developer. In general the photographic technique is the same as when using the standard materials. Densitometric control is applicable. Some masking and/or hand retouching may be necessary but is usually less than that required in the standard method.

* INFRARED — HOW IT IS USED IN REPRODUCING COLORED COPY. David O. Johnson. *Modern Lithographer* 18, No. 7, July, 1950, Pages 34-35 and 87, 89 (4 pages). The black printer negative of a set of color separation negatives usually requires more correction than the others. By using an Infrared Sensitive plate a good black printer can be produced from oil or water color copy. Infrared plates cannot be used with color transparencies or dye color prints because no tone rendering is possible. In combination with a Wratten 88A filter the infrared plate produces a black printer negative which reproduces only the black or densest areas. Colored filters can be used with Infrared-Sensitive plate in much the same manner as with other photographic materials.

* ELECTRONIC SCANNERS FOR COLOR CORRECTION. Frank Preucil. *National Lithographer* 57, No. 8, August, 1950, Pages 28 and 29 (2 pages). An electronic scanner using a rotating mirror principle has been developed. A mirror mounted on three axes scans a transparency illuminated by a beam spot. The image is formed by a lens. Color correction is accomplished by increasing or decreasing the intensity of the exposure beam. Two separate photocells provide contrast control. A yellow color balancing filter is put over the tone control cell and a potentiometer adjustment gives desired brightness range. To permit developing all the separation negatives at the same time the contrast control setting of the blue filtered yellow separation is diminished to give the compensating contrast.

* CHROMA-GRAPH COLOR SEPARATIONS ACHIEVED BY MINIMUM OF HAND WORK. Joseph Brauer. *Printing Magazine* 74, No. 8, August, 1950, Pages 65 and 66 (2 pages). The Chroma-Graph Process is the method of making color separations using high contrast plates coupled with long tone scale and developed in a dye-alkali developer. Because big hilights do not require opaquing and there is less tonal correction, hand work is reduced. Color correction is accomplished by using a high contrast or the booster mask developed in the special dye-coupler solution. Although the process is different from orthodox color separation it can be performed by any good color separation photographer in a short time.

* THE MASKING PROCESS FOR PHOTO-MECHANICAL CORRECTION IN PHOTOGRAVURE. W. Schupp. *Polygraph* 3, 17, September 5, 1950, Page 600. (In German). The method recommended by the author is outlined; this is claimed to obviate the flattening effect inherent in the American process. The negative masks exhibit the same differences in density as the three tone- and colour-corrected colour separation negatives. Consequently a "compensative" is obtained which corresponds only to the colour corrections necessary and which is neither a negative nor a positive; it produces only the required degree of blackening in the colour tones. Further details are to be given in a work by the author, "Neue Wege zur Herstellung ton- und farbwetichtriger Druckformen," to be published by the Polygraph Verlag. *Printing Abstracts* 5, No. 11, November, 1950, Page 519.

* THE REPRODUCTION OF COLOUR PHOTOGRAPHS. H. M. Cartwright. *Photographic Journal* 90B, No. 5, September-October, 1950, Pages 125-28 (4 pages). The Characteristics of different processes are considered briefly, but colour half-tone, which allows of more accurate colour correction is described in detail. The discontinuous half-tone structure is not generally apparent though it may sometimes be the cause of unwanted hue variations. A colour print on paper (which allows of retouching and the addition of artist's work) is the most acceptable form of original. "Additive" transparencies have

a suitable range but their colours tend to be de-saturated; narrow-cut filters should be used in making colour-separation negatives from them. Integral tri-pack transparencies are popular but their high contrast range is a drawback. Direct screen negatives are generally used in the reproduction of colour prints on paper and corrections are made by fine-etching. The indirect process is often used in reproducing colour transparencies, partial correction being made by masking. The use of colour inks made to the British Standards specification should lead to better results when several different subjects are printed together.

* ELECTRONIC SCANNERS FOR COLOR CORRECTION. Frank Preucil. *National Lithographer* 57, No. 9, September, 1950, Pages 34-5 and 90-1 (4 pages). Much of the electronic color corrector has been borrowed from the field of picture transmission. In describing several picture transmitters the author gives a brief historical background of the color scanner.

*KEMART FLUOROSTOP—ITS USE IN COLOR CORRECTION. Frank P. Adams. *Photo-Engravers Bulletin* 40, No. 4, November, 1950, Pages 109-11 (3 pages). The Kemart Fluorostop is a thin transparent plastic sheet. It is transparent to all colors except ultra-violet, so that it prevents artists' colors from fluorescing under arc lights during the color separation. Highlighting can be accomplished by painting on the surface of the Fluorostop with a special paint.

*ELECTRONIC COLOR CORRECTION. F. L. Wurzburg, Jr. *Photo-Engravers Bulletin* 40, No. 4, November, 1950, Pages 52-5 (4 pages). In halftone process color printing, color and gradation results from variations in fractional printing area, the concentration and film thickness being held constant. This is fundamentally different from continuous tone photographic processes and requires a different approach to color correction. In a process which Interchemical has been developing for a number of years, color corrections for halftone printing is produced by use of a high speed electronic scanning technique on continuous tone separation positives. The manner in which this scanning technique works is described briefly.

*KOLOROID COLOR PROOFING PROCESS. Joseph E. Johnston. *Printing Equipment Engineer* 81, No. 2, November, 1950, Pages 42-3 (2 pages). The Koloroid Color Proofing Process is a method of making pre-proofs from separation screen or continuous tone negatives. The method is similar to the carbon process in photography, forming images composed of pigments held in a colloid binder. It is announced that a wide range of colors will be offered to the trade.

*NEW TECHNIQUES IN THE REPRODUCTION OF KODAK EKTACOLOR FILM. David O. Johnson. *Photo-Engravers' Bulletin* 40, No. 4, November, 1950, Pages 225-8 and 230-3 (8 pages). The applications of two new materials, Kodak Ektacolor Film and Ektacolor Print Film, in the graphic arts are discussed. Methods of preparing color corrected halftone transparencies from Ektacolor Film are described in some detail (Ektacolor Film is a negative color process and contains integral masks for color correction).

* A DYE CHEMIST'S VIEWS ON COLOR SEPARATION. Robert G. Patterson. *American Photo-Engraver* 42, No. 11, November, 1950, Pages 1102-4 (3 pages). To get another viewpoint on the problem of improving color separations the author quotes the opinions expressed by Dr. Kurt Wolfson, a manufacturer of photographic sensitizing dyes. Dr. Wolfson believes that the manufacture of a special set of emulsions which are sensitive only to very narrow spectral ranges is not the approach to

take. Narrow band filters accomplish this much with the emulsions available. It is his opinion that the crux of the problem lies with the pigments used in color copy and in printing inks.

* NEW MACHINE FOR COLOR CORRECTION ANNOUNCED. *National Lithographer* 58, No. 1, January, 1951, Pages 34, 81-2 (3 pages). The Long Photo-Corrector can optically superimpose, in sequence, four different images. When these four images are photographed upon a single plate, the result is a photographic "corrector". It is stated that this corrector can take the place of the original negative, can be in the form of a positive, or can be a mask for a separation negative.

* THE ROOKYARD CHROMOMETER. *Canadian Printer and Publisher* 60, No. 1, January, 1951, Page 41. The Rookyard Chromometer is an instrument designed to give the color etcher the dot value of each primary color including the black-plus the dot value that enters into "69,000 various colors and shades." The instrument is claimed to relieve the etcher of the need of color charts in order to find a color match. It is not at present available to the trade.

BRITISH PATENT 631,095. L. C. Jesty. *Monthly Abstract Bulletin*, Kodak Research Laboratories, 37, No. 2, February, 1951, Page 80. In a system for producing color-corrected copies, a color original is scanned by the white-light spot from the screen of a cathode-ray tube. The scanning beam then passes through a color-separation filter and is recorded on a photographic emulsion. Color control is introduced by varying the intensity of the exposing beam by splitting out light from it and passing it through appropriate subsidiary filters to photoelectric cells. The output from the cells is made to modulate the intensity of the cathode-ray spot. The scanning is repeated for each of the color components it is desired to separate.

* MASKING EXPLAINED GRAPHICALLY. *National Lithographer* 58, No. 5, May, 1951, Pages 33-37 (5 pages). An attempt is made to graphically explain photographic masking techniques for tone and color correction. Starting with an oil painting as the original, the appearance of the separation negatives and the required tone and color correction masks are shown and explained. Included is a four color reproduction of the oil painting made from the negatives and mask described in the article.

*MASKING—DEBUNKING A FEW RUMORS. Henry R. Long. *National Lithographer* 58, No. 4, April, 1951, Pages 38-39 (2 pages). The author states that executives are often misled by the claims made for various methods of color correction by masking processes. Pointing out that many rumors of large savings in production time by particular masking methods are most often based on a certain set of conditions not found in the average plant, the author believes that there is no existing masking system that without knowledge and skill will, unchange from a rigid formula, satisfy the maximum requirement of the many types of color process work going through the average plant.

Platemaking: Chemistry

* ATOMIC ENERGY IN OFFSET RESEARCH. Paul J. Hartsuch. *Canadian Printer and Publisher*, 59, No. 9, September, 1950, Pages 42, 44 & 46 (3 pages). A discussion of the preparation of P^{32} and its uses. Application to determine the presence of absorbed films of counter-etches, the effect upon absorption of flaming a zinc plate, the role of phosphoric acid in a desensitizing etch, and others are discussed.

* HEY BOSS! WHAT'S A COLLOID? *Graphic Arts Monthly* 23, No. 6, June, 1951, Pages 86 and 107 (2 pages). A non-technical description of colloids and their properties from a lithographer's standpoint. The differences between "true solutions," "colloidal solutions," and "suspensions" are described.

Platemaking: Equipment and Methods

COMBINED PRINTING AND WHIRLING DEVICE. J. N. Zachmann and R. L. Franklin. *U. S. Patent 2,512,126.* The plate is coated and whirled on a motor-driven turntable in a cabinet with hinged doors at the front. The printing frame with rubber pressure pad is located on the top of the cabinet, the exposing lamps being vertically above. *Printing Abstracts*, Part 1, 1951, Page 40.

CENTRIFUGAL EMULSION COATING MACHINE. F. H. Hausleiter. *German Patent 746,961.* The light-sensitive coating is applied to the centre of the rotating plate or film from a funnel held by a movable arm. The opening of the funnel can be varied to adjust the coating speed to the viscosity of the liquid. *Printing Abstracts*, Part 1, 1951, Page 5.

PHOTOCOMPOSING MACHINE. Theodore Hommel. *U. S. Patent 2,547,527. Official Gazette* 645, No. 1, April 3, 1951, Page 222. A photo-composing machine for stepping up a film negative upon a photo-sensitized printing roller comprising a frame having spaced parallel bearings, a mandrel rotatably mounted upon and extending through said bearings for concentrically receiving and supporting said roller, means associated with said mandrel in any one of a series of selected positions of rotation, rings mounted on the mandrel for endwise engagement with the roller, said rings having a plurality of suction ports, means for holding a film negative over the mandrel so that the center line of the negative is disposed accurately in spaced parallel relation to the center line of the mandrel and the end margins project over the rings, longitudinally extending suction members for releasably holding the longitudinal margins of the film negative in closely conformed overlying relationship upon the roller, and means for drawing air from between the negative and roller by suction exertion through the suction ports of the rings and through the suction members.

Platemaking: Materials and Methods

THE QUESTION OF SUBSTITUTES IN OFFSET COPYING. Otto Watter. *Druckgewerbe* 1948, Pages 164-7 (4 pages) Chem. Zentr. (Russian Zone Ed.) 1948, II, Pages 921-2 (2 pages). The use of various substitutes for gum arabic is discussed. These include dextrin, fish glue, methylcellulose, or yeast protein,

* THE EFFECT OF MOISTURE ON PLATES. A. G. Arend. *Modern Lithographer and Offset Printer* 46, No. 6, June, 1950, Pages 115-16 (2 pages). Methods are prescribed for washing out of litho plates, and putting a water insoluble film over the gum and image. Methods are also described in detail for the removal of these films prior to printing on the press.

* GUMMING INFORMATION. *Graphic Arts Monthly* 22, No. 7, July, 1950, Pages 74, 76 and 78 (3 pages). The formula for a cellulose gum etching solution and detailed instructions for its application are presented. The role of citric acid in deep-etch platemaking is discussed, and it is pointed out that no acids should be used unless the stencil adheres so strongly that they are required to clear the plate. The merits of Fresh vs. Green etch are also discussed and compared.

* THE MANUFACTURE OF FINE METAL GRIDS BY A PHOTOMECHANICAL PROCESS. E. E. Loening and D. C. Gresham. *Process Engravers Monthly* 57, No. 684, December, 1950, Pages 358, 61-2 (3 pages). A process is described wherein extremely fine copper grids are produced by a lithographic process. Details are given on double coatings, and small scale plating.

GLUE INSTEAD OF GUM ARABIC FOR OFFSET PLATES. *Poligraficheskoe Proisvodstvo* (in Russian); *Buchgewerbe* 5, No. 11, 1950, Pages 416-17 (in German). Details are given of a method of producing photo-litho plates using dichromated animal glue in place of sensitized gum arabic. The plates are claimed to be equal in quality to plates from dichromated gum. Dextrin solutions are used as desensitizers. *Printing Abstracts* 6, No. 2, February, 1951, Page 68.

*CELLULOSE GUM SOLUTIONS. *Research Progress* No. 19, Pages 1 & 4 (2 pages). A method is described whereby dry cellulose gum can be put into solution to form an etch or gum in less than five minutes. The method makes use of isopropyl alcohol to form a slurry before the water is added. Press tests show the standard etch and the alcohol-mix etch to be just alike in desensitizing characteristics.

*WATER AS A SUBSTITUTE FOR ALCOHOL. Charles F. King. *Inland Printer* 126, No. 6, March, 1951, Pages 41-43 (3 pages). The author reviews the L.T.F. Research Bulletin No. 14, by R. F. Reed and C. F. King, which was based on research work done a number of years ago when alcohol was engaged in helping to win World War II. Included in this article are several points concerning the operation of this process which have received little or no consideration in previous discussion of it.

Platemaking Temperature and Humidity

* THE LTF RH-EXPOSURE CHART. *Research Progress* 19, May-June, 1950, Pages 3 and 4 (2 pages). The exposure chart tells how much an exposure that is known to be correct should be changed to compensate for changes in relative humidity. Examples on the use of the chart, and precautions to be observed, are given.

* RELATIVE HUMIDITY. *Graphic Arts Monthly* 22, No. 7, July, 1950, Pages 65, 66 and 96 (3 pages). Relative humidity has a pronounced effect on the light sensitivity of a bichromated colloid type of coating. Relative humidity must be measured, and the measurement must be made as close as possible to where the plate is being made. A slight change in atmospheric temperature will give a great change in relative humidity.

* TEMPERATURE AND PLATE COATINGS. Charles F. King. *Inland Printer* 126, No. 4, January, 1951, Pages 39-41 (3 pages). The author discusses a recent article in L.T.F.'s *Research Progress* on the influence of temperature on plate coatings. The author believes that due to the magnitude of the effect of temperature on coating sensitivity much of the earlier measurements of coating sensitivity, such as the LTF Nomograph,

are doubtful as they did not take into account the effect of temperature. (Abstractors note: in LTF study the sensitivity measurements were made at a standard temperature of 78° ± 2° F). Suggested applications of the heat effect and the need for exposure charts which include both heat and humidity are also discussed.

Platemaking: Graining

GRAINING OR ABRAIDING LITHOGRAPHIC PLATES OR THE LIKE BY CENTRIFUGAL BLAST OF WET SLURRY. Otto E. Zahn. *Official Gazette* 640, No. 4, November 28, 1950, Pages 1333-4. *U. S. Patent* 2,532,136. In a graining machine, an upright, substantially cylindrical cabinet, a non-directional blast wheel whose plane is substantially horizontal, means for rotating said wheel, said wheel comprising a plurality of substantially radial blades and having an open center, a feed conduit feeding material to said open center, means for feeding a slurry of liquid and solid particles to said conduit, an elevator cage having means for supporting the plate to be grained, and means for reciprocating said cage up and down in a path surrounding said wheel to subject substantially all parts of the work plate to said slurry blast.

* WHY CLEAN PLATES IN A GRAINING MACHINE? Thomas C. Atwell and William C. Stone. *Modern Lithography* 18, No. 12, December, 1950, Page 39. To reduce the regraining time required for litho plates, especially lacquered albumin and deep etch plates, a pregraining cleaning operation was introduced. This cleaning was done by scrubbing with a special chemical. Experiments revealed that the cleaning time was reduced about 50%. No conclusions were reached as to when graining was complete.

* WHY CLEAN LITHOGRAPH PLATES IN A GRAINING MACHINE? Thomas C. Atwell and William C. Stone. *Share Your Knowledge Review* 32, No. 5, February, 1951, Pages 21-2 (2 pages). Considerable time is saved by chemically cleaning plates before regraining instead of doing the cleaning during the regraining process.

Platemaking: Metal Surfaces

PROCESS OF COATING ALUMINUM PLATES. Michael H. Bruno and Paul J. Hartsuch. *United States Patent 2,507,956.* Process of coating aluminum plates which are particularly desirable in the process of lithography is disclosed. Coating requires from one to five minutes at room temperatures. The surface of the metal is subjected to the action of an aqueous coating agent having a pH less that 3 but sufficiently high numerically to avoid the evolution of gaseous hydrogen. The agent consists essentially of water, an amount of hydrofluoric acid stoichiometrically equivalent to 0.25 to 11 grams of gaseous hydrogen fluoride per liter of ammonimum dichromate. Amount of hydrofluoric acid is low when that of ammonium dichromate is low and high when the latter is high. *Printing Equipment Engineer* 80, No. 4, July 1950, Page 62.

* PATRAL: AN IMPROVED TREATMENT FOR ALUMINUM LITHOGRAPHIC PRINTING PLATES. Printing, Packaging & Allied Trades Research Association. *Patra Information Leaflet* No. 37, 1950, Pages 1-6 (6 pages). The process is an improvement on the Brunak (LTF) process designed to prevent the oxidation of aluminum litho plates. Details of the process are given. *Printing Abstracts* 5, No. 11, November, 1950, Page 516.

"WHITE RUST" FORMATION ON ZINC. P. T. Gilbert and S. E. Hadden. *Chemical Abstracts* 45, No. 2, January 25, 1951, Page 526. The conditions under which Zn corrodes in moist atms., with the formation of a voluminous white corrosion product known as "white rust" were investigated. In unpolluted air of 100% relative humidity Zn was only tarnished, but white rust was rapidly produced when specimens were wetted with distd. H_2O and kept in a humid atm. The corrosion product usually consisted of basic zn carbonate, but this was sometimes mixed with ZnO, and in the absence of CO_2, ZnO only was detected. The rate of corrosion was not altered by removing CO_2 from the atm., and the primary reaction is the formation of ZnO. H_2O pptd. at the meeting plate of Zn ions and OH^- formed by electro-chem. action. The rate of corrosion increased considerably when polluting substances such as SO_2, HCl, or org. acids were present in the atm., or when galvanizing-flux residues remained on the Zn surface. The rate of attack decreased in the presence of NH_3 or high conens, of CO_2. Simple immersion treatments in dil. chromate solns. give considerable protection from white rusting in storage or transit as did quenching in similar solns. after galvanizing.

Platemaking: Etching

PRODUCTION OF PRINTING FORMS. C. B. Aller. *British Patent* 635,583. The sideways etching of the plate is limited by using a sulphide-forming etching agent, the etching of which is restricted by the surface or edge of a coating of zinc or cadmium. *Printing Abstracts* 5, No. 6, June, 1950, Page 291.

ETCHING OF ALUMINUM. *U. S. Patent 2,556,626.* Charles Edmund Meulendyke. *Official Gazette* 647, No. 2, June 12, 1951, Page 542. In the arts of metal-decoration and photomechanical printing, the method of etching aluminum by applying a solution containing cupric chloride, glycerine and ortho phosphoric acid to an aluminum sheet supporting local resists.

Platemaking: Albumin

* HUMIDITY PROBLEMS CONTROLLED IN NEW ALBUMIN PLATE TECHNIQUE. L. Perry. *Graphic Arts Monthly* 22, No. 8, August, 1950, Pages 144, 46, 48, 50 and 52 (5 pages). A report on the "Bronztone" process. Included are detailed albumin platemaking procedures which if followed should give trouble free, year round albumin plates. Instructions given cover: (a) Pretreatment or counteretching, (b) Sentitizing, (c) Exposure and development, (d) Desensitizing the non-image. "Bronztone" is applied as a pretreatment, and consists of immersing the plate in a solution which deposits a thin brownish film of high wettability. Claims made for "Bronztone" are: thinner coatings, slower staling, easier development, and better desensitization.

*TESTS SHOW TECHNICAL GRADE ALBUMIN SATISFACTORY FOR COATINGS. *Modern Lithography* 19, No. 3, March, 1951, Pages 55-57 (2 pages). Good quality "technical grade" albumin is just as satisfactory as "edible" grades for use in coating solutions. Except for color, there were few significant differences between them. The amount of residue left in the bag varied considerably, possibly providing a test for economically selecting a technical grade albumin. Blood albumin is poor.

Platemaking: Deep-etch

* CAN COPYING LAYERS LEAD TO TONING IN OFFSET PRINTING. H. Eggen, *Polygraph* 3, No. 9, May 5, 1950, Pages 290-1 (2 pages) (In German). It is considered that toning is never due to the copying layer in the positive process. *Printing Abstracts* 5, No. 7, July, 1950, Page 341.

* WHEN IS A DEEP-ETCH PLATE BLIND? *Research Progress* 19, May-June, 1950, Pages 2 and 4 (2 pages). This article discusses blind images due to gum remaining on the image after development. High RH has a great effect on the dark reaction, and when the plate is developed out with the usual technique, residual hardened stencil remains on the image areas. A method of determining if a plate is blind is given, and advice offered on what to do when the RH gets above 70%.

* DETAILED REPORT ON THE DEEP ETCH PROCESS. PARTS III AND IV. *Harris Impressions* 10, No. 3, May-June, 1950, Pages 1-3 (3 pages). The developer, a solution of alkaline earth chlorides and organic acids, is applied until frothing occurs in the unhardened areas, whereupon two more applications are poured and spread on the plate for the same length of time as the first, subsequently etching the thus exposed bare metal areas from ½ to 1½ min. followed by thorough washing of said etched areas, followed by an application of lacquer to said areas, fan drying same, and applying asphaltum, developing ink, or both to said same. This detailed article is part of a series on deep-etch plate-making.

* BE CAREFUL WITH DEEP-ETCH LACQUER. *Graphic Arts Monthly* 22, No. 7, July 1950, Pages 80 and 82 (2 pages). When applying lacquer to a deep etch plate, one must first be certain that the plate is dry and clean, and second, apply just enough to get complete coverage, rub it down smooth, and apply the developing ink immediately.

*MAKING GOOD DEEP-ETCH PLATES. Charles F. King. *Inland Printer* 127, No. 1, April, 1951, Pages 49-51 (3 pages). The importance of having the proper grain and its effect on the formation of the ink image base is pointed out. Some rules for platemakers to follow to insure that the image areas are well ink-receptive are offered.

Platemaking Polymetallic

THE "SACHSENPLATTE" (SAXONY PLATE) FOR OFFSET PRINTING. *Graph. Markt.* 5, No. 15, May 30, 1950, Page 312 (In German). The plate is a copper plate, deposited by a weak current, covered with a thin chromium deposit. The chromium is removed at the image areas. *Printing Abstracts* 5, No. 8, August, 1950, Page 389.

METHOD FOR THE PRODUCTION OF METALLIC PRINTING MEMBERS. John E. Morse. *Official Gazette* 634, No. 1, May 2, 1950, Page 207. *U. S. Patent* 2,506,164. In the production of a metallic printing member presenting an aluminum surface partially covered in areas of predetermined outline with an integrally deposited coating of metal selected from the group consisting of copper and nickel, the steps comprising covering said surface with a masking coating containing openings having said predetermined outline within which areas of said aluminum surface having said predetermined outline are exposed, etching said aluminum surface of said exposed areas of predetermined outline not covered by said masking coating with the aqueous etching solution which comprises an anion of a strong mineral acid to thereby remove aluminum oxide from said areas and to render said areas receptive to electroplating with said metal selected from the group consisting of copper and nickel, removing said masking coating leaving both the etched areas and unetched portions of said aluminum surface exposed, and while said etched areas and said unetched portions of said aluminum surface are exposed subjecting said aluminum surface to electroplating for deposition of said metal selected from the group consisting of copper and nickel from an acidic aqueous

solution of a salt selected from the group consisting of cupric salts and nickel salts, whereby said metal is selectively deposited as an integral firmly adherent coating only on said etched areas of predetermined outline.

EXPERIENCES WITH THE EFHA STEEL PLATE. P. Benner. *Druckspiegel* 5, No. 11/12, June, 1950, Pages 254-6 (3 pages), (In German). Hauslieter used the softer metal (brass) as the base plate and nickel as the metal which is exposed to the friction of the machine and he also used a positive print. The printing therefore took place from the etched areas. The preparation of the plate is briefly described. *Printing Abstracts* 5, No. 8, August, 1950, Page 389.

* PROGRESS IN POLYMETALLIC PLATES. Herbert R. Leedy. *Harris Impressions* 10, No. 5, September-December, 1950, Pages 1-3 (3 pages). A nonpartisan survey of polymetallic plates, including a discussion of the metals used and their combinations, the advantages and features of polymetallic plates, and a chart illustrating positive and negative processes. It is pointed out that it is not the metals themselves that possess lithographic properties, but the chemical treatments given their surfaces. Neither the processes nor the plates are evaluated.

IMPROVEMENTS IN THE MANUFACTURE OF LITHOGRAPHIC PRINTING PLATES. Coates Bros. & Company, Ltd. and Lancelot Coates. British Patent 640,470. *Tin-Printer and Box Maker* 26, No. 311, December, 1950, Page 12, A bi-metallic lithographic printing plate has a matt or polished chromium water-receptive and ink-refusing surface and a copper water-refusing and ink-accepting printing area. The ink-refusing surface is in slight relief relatively to the printing area. The surface of the copper is smooth. Modifications are described.

* FOR METAL DECORATING — BETTER PLATES ARE HERE. Michael H. Bruno. *National Lithographer* 57, No. 12, December, 1950, Pages 36-7 and 83, 91-2 (5 pages). The various plates and plate treatments available are discussed. Bi-metallic plates produce longer runs, more consistent quality, and use less water and ink. This is due to the fact that the same treatment on the different metals makes the image metal ink receptive and the non-image metal water receptive. The Cronak treatment for zinc inhibits corrosion, facilitates stencil removal, and improves desensitization. Treatment both before plate coating, and after developing of albumin plates gives results comparable to deep-etch plates. The Brunak treatment for aluminum eliminates ink dot scum. Improvements in desensitization with gum arabic and cellulose gum are described which produce longer lasting plates. The sensitivity guide can be used to tell when the plate is properly exposed and when the sensitivity of the coating is changing. Presensitized plates are based on the use of hydrolyzed acetate sensitized with diazo compounds. They are very simple to use and insensitive to storage, heat, and humidity. The Colloid Litho plate may be interesting during a period of plate metal shortages.

* PICTORIAL DEMONSTRATE NEW PATENTED BIMETAL PROCESS; COPPER CHEMICALLY DEPOSITED ON ZINC AT DEEP-ETCH STAGE. *British and Colonial Printer* 148, No. 1154, January 12, 1951, Pages 31 and 46 (2 pages). The usual zinc plates are used and grained according to standard practice. After coating with the light-sensitive solution and exposing under a positive, development is accomplished in the customary manner. A layer of copper is then chemically deposited in the image areas by using a special coppering solution. After inking the plate, the colloid stencil is removed. The technique is similar to established

deep-etch methods. Details are given of the technique used. *Printing Abstracts* 6, No. 3, March, 1951, Page 102.

Platemaking: Stainless Steel

PHOTO-LITHOGRAPHIC PLATES AND PROCESSES FOR THEIR MANUFACTURE. Lord Baltimore Press, *Printing Abstracts* 5, No. 10, October, 1950, Page 473. *British Patent* 641,646. A stainless steel plate is made by graining the plate to extreme fineness, coating, exposing, developing and etching the plate, applying a greasy material to the etched portions and removing the rest of the coating. A screen of at least 133 lines per in. is used. Details are given of the graining abrasives, pre-etching solution, light-sensitive coating, etch, stopping-out solution and developing ink recommended.

Platemaking: Magnesium Resist

* GACO MAGNESIUM RESIST. *Printing Equipment Engineer* 81, No. 2, November, 1950, Page 40. Bulletin available: Jones Graphic Products Co., 118 North Third Street, Albuquerque, N. M. Intended for use on 16 ga. and 11 ft. plates and thin magnesium relief (dry) offset plates. Plates may be precoated and stored one to two weeks. Permits fine screen engravings on magnesium. Process: coated, exposed, tap water developed, chemically fixed, blackened for contrast, then low temperature burn-in.

Platemaking: Resins and Plastics

* CELLULOSE ACETATE OFFSET PRINTING PLATE. Walter Clark. *Modern Lithography* 18, No. 12, December, 1950, Pages 40-41 (2 pages). Cellulose acetate can be hydrolyzed to cellulose. This property has led to its use as a material for making lithographic plates. Plates made from it consist of two layers, the acetate layer and a metal backing for dimensional stability. Sensitized with a bichromate solution the plate is exposed in the conventional manner and processed by swabbing with an alkali solution which may or may not have an oxidizing agent. The plate is then neutralized with acid and rinsed with water. This Ektalith cellulose acetate plate has produced runs of 75,000 with line work and 40,000 with halftones. Satisfactory color reproduction has been obtained on small offset duplicating presses and has led to the possibility of its use to produce cheaply color illustrations for text books, magazines, etc.

METHOD AND PLATE FOR LITHOGRAPHIC PRINTING. William Craig Toland and Munroe H. Hamilton. *Official Gazette* 641, No. 1, December 5, 1950, Page 231. *U. S. Patent* 2,532,866. An improved printing plate of the lithographic printing class for use in a printing machine wherein the surface of the plate is alternately moved into contact with a water roller and a greasy inking roller, said plate comprising a flexible base member, a thin hydrophilic coating of collodial material bonded to the base member, said coating including at its exposed surface area relatively hard grease receptive printing portions and relatively yieldable water receptive non-printing portions, scum retardant means in the non-printing portions operative in the presence of moisture applied

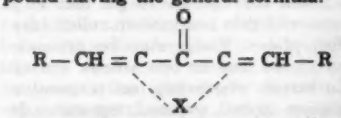
thereto from the water roller to repel adhesion of small amounts of greasy ink to the said non-printing portions when the latter are contacted by the inking roller, said scum retardant means comprising a water-soluble dibasic acid occurring in the form of a finely divided solid which is distributed throughout the non-printing portions.

PRODUCTION OF PLANOGRAPHIC PRINTING PLATES. A. Abbey. *British Patent 622,108.* A method of making a planographic printing plate having water-receptive areas is claimed, the method comprising the application to a paper foundation of a film containing a carboxymethyl ether of cellulose or a salt or a derivative thereof followed by an ink-receptive water-repellent image. The coating is insolubilized by heat or by a reagent, either simultaneously with or subsequently to its application, and the ink-receptive water-repellent image is applied either before or after the insolubilizing treatment. The insolubilizing reagent is included in the paper foundation, in the coating solution, or in the wetting solution which is supplied to the printing plate from the fountain of the printing machine, this reagent being aluminum sulphate. Further methods claimed incorporate a melamine, a methylol urea or a urea formaldehyde to increase the wet strength of the paper foundation and to limit its water-absorption capacity, also an inert filler such as China Clay and a plasticiser to accelerate drying and solidifying of the coating. Examples of the preparation of surface coating solutions and the manufacture of a water proofed planographic printing plate are given. *Printing Abstracts,* Part 1, 1951, Page 38.

PLANOGRAPHIC PRINTING PLATE AND METHOD OF PREPARING THE SAME. Charles H. Van Dusen, Jr. *U. S. Patent 2,542,784. Official Gazette* 643, No. 3, February 20, 1951, Page 968. A planographic printing plate comprising a foundation, and a film on the surface of said foundation containing a carboxymethyl cellulose compound as the essential film-forming component thereof, said film being grease-and-water-receptive when dry and grease-repellent when wet, and an ink-receptive water-repellent image on the surface of said coating.

IMAGE-FORMING COMPOSITION AND A PROCESS OF MAKING IT. Charles H. Van Dusen, Jr. *U. S. Patent 2,545,125. Official Gazette* 644, No. 2, March 13, 1951, Page 538. An image-forming composition which is especially adapted for use in forming direct images upon planographic printing plates, said image-forming composition consisting of a solution of a nigrosine base black dye in tricresyl phosphate glycol monolaurate as a diluent, and containing stearic acid introduced into the composition as an initial ingredient thereof in an amount not substantially less than two per cent nor substantially more than four per cent of the composition, by weight, said image-forming composition being substantially free of carbon black.

METHOD OF MAKING PHOTOGRAPHIC RELIEF IMAGES. Werter P. Van Deusen. *U. S. Patent 2,544,905. Official Gazette,* 644, No. 2, March 13, 1951, Page 477. The method of making a photographic relief image which comprises coating a support with a layer of a mixture of a polymeric material selected from a group consisting of cellulose ethyl ether and acrylate resins, and a light-sensitive alketone compound having the general formula:



where R represents a member selected from a group consisting of furfuryl, styryl and an aryl group of the benzene

series, X represents the atoms necessary to complete a cyclic ring of from five to six carbon atoms, forming a relief image in said layer by exposure to an image and washing away the unexposed area of said layer with a solvent for only said area.

METHOD OF MAKING CELLULOSE ESTER LITHOGRAPHIC PRINTING PLATES. William O. Kenyon and Cornelius C. Unruh. *U. S. Patent 2,548,537. Official Gazette* 645, No. 2, April 10, 1951, Page 594. The method of forming a design on a cellulosic surface for printing purposes, which comprises sensitizing a hydrolyzed surface layer of a cellulose organic acid ester sheet with an oxidant for hydrolyzed cellulose ester whose oxidizing effect is accelerated by light selected from the blue and ultraviolet regions of the spectrum, exposing said sensitive layer under a design, thereby oxidizing and rendering the exposed area of said surface layer removable with alkaline solution, and selectively removing said exposed area with an alkaline solution free of oxidizing agents.

PLANOGRAPHIC PRINTING. Clarence A. Brown. *U. S. Patent 2,550,326. Official Gazette* 645, No. 4, April 24, 1951, Pages 1273-1274 (2 pages). A planographic printing sheet consisting of a sheet of metal foil with a sheet of water resistant paper adhered to each face of the foil and a layer on the outer surface of one of the sheets of paper, said layer being the residue of an aqueous solution dried onto the paper, and the essential ingredients of the solution and their proportions being approximately 10% of water-soluble ureaformaldehyde plastic, 70% of a mixture of 1 part tri-calcium phosphate to 2.5 parts clay and 20% highly polymerized high saponification polyvinyl alcohol.

* LIGHTSENSITIVE LAYERS OF POLYVINYL ALCOHOL. *Grafiska Forshninglaboratoriets* 26, May, 1951, Pages 76-79 (4 pages) in Swedish. The use of polyvinyl alcohol enamel is discussed. Formulas and directions are given.

Platemaking: Gelatin Process

PLANOGRAPHIC PRINTING. Photo Products Gevaert, *Procede* 46, No. 3/4, 1950, Page 31. *French Patent 953,096.* A layer of gelatine to which an inert mineral (chalk, oxides, sulphates) may be added is coated on paper or a film, etc. This layer is impregnated with tanning agents which render the hydrophilic binder lipophilic, for example the gelatine is impregnated with a solution containing 100 c.c. formol, 20 g. of pyrogallol and 5 g. of potassium ferrocyanide per litre. After drying, the image is drawn on the gelatine layer with a lithographic crayon or typed on with a ribbon impregnated with a fatty ink. The non-image areas are rendered hydrophilic by damping with a solution of 25% gum arabic and 2% of cupric chloride. The image can also be produced photographically. For this purpose the hydrophilic coating is covered with an untanned silver gelatin-obromide emulsion; after exposure, the positive print is developed in a tannin developer and the undeveloped areas removed with tepid water. The non-image areas are desensitized as above. *Printing Abstracts* 5, No. 6, June, 1950, Page 341.

* PLANOGRAPHIC PRINTING AND ADHESIVE SHEETING FOR USE THEREIN. Charles H. Van Dusen, Jr. *U. S. Patent 2,540,158. Official Gazette* 643, No. 1, February 6, 1951, Page 81. In the art of planographic printing from paper planographic printing plates, the improvement which resides in masking out a selected area of the printing surface of a paper planographic printing plate prior to conditioning the said paper planographic printing plate for use in a planographic printing op-

eration by applying over the said selected area of the printing surface of the said paper planographic printing plate an adhesive sheeting consisting of a flexible transparent backing or base sheet having on one surface thereof a normally tacky and pressure-sensitive flexible adhesive coating by means of which the said adhesive sheeting is adhesively secured in position of use over the said selected area of the printing surface of the said paper planographic printing plate and having on its opposite surface a water-soluble non-tacky coating composed of one or more materials which are substantially devoid of any affinity for the said pressure-sensitive flexible adhesive coating and which are selected from the group consisting of gelatin, dextrin, starch, polyvinyl-alcohol and gum-arabic, forming a planographic image on the printing surface of the said adhesive sheeting and over the said water-soluble non-tacky coating thereon by means of a planographic image-forming material, and washing the printing surface of the said planographic printing plate and the said water-soluble and non-tacky coating and the said planographic image on the said adhesive sheeting with an aqueous planographic etching solution as an incident to conditioning said paper planographic printing plate and the surface of the said adhesive sheeting having the said planographic image thereon for use in a planographic printing operation.

BICHROMATE SENSITIZED PHOTOGRAPHIC MATERIALS. Robert S. Bryce. *U. S. Patent 2,544,877. Official Gazette* 644, No. 2, March 13, 1951, Page 471. A light-sensitive coating composition comprising a mixture of a bichromated gelatin, an aqueous dispersion of a water-insoluble soft synthetic resin capable of drying to a continuous film when the dispersion alone is coated on glass and said resin being selected from the group consisting of acrylate, styrene, vinyl ester and neoprene resins, a pigment and sodium hexametaphosphate.

Ink — General

* PRINTING INK RAW MATERIAL OUTLOOK. *American Ink Maker* 29, No. 2, February, 1951, Pages 31-4 and 63-5 (6 pages). It is expected that the ink industry will be accorded a high priority in the defense picture. The pigment color industry is sufficient to take care of most civilian and rearmament requirements, but the raw materials used by the industry may be restricted. Titanium dioxide pigment is in short supply. A shortage of sulfuric acid to the pigment industry would result in reduced production. Defense requirements will probably pyramid, resulting in quota cuts. Supplies of ester gum, limed rosin, pentaerythritol esters, phenolic resins, and maleic resins will be reasonably good. Phenol and maleic anhydride (used in phenolic resins, and maleic rosin modified resins) are in short supply and face a serious shortage due to a scarcity of benzene. Availability will depend on future government regulations on the use of strategic raw materials. Channel carbon blacks should be available unless natural gas is diverted to manufacture of rubber compounding carbons. Long flow blacks are in tight supply, but supplies should be available in 1951. Defense legislation should not affect the supply. Furnace carbons are used with synthetic rubber; so the government may restrict their use to government rubber production. Prices on all blacks will go up. Supplies of drying oils are good. Restrictions on alkyd type varnishes will probably become more stringent. Supplies of oils are as follows: soyabean—adequate, fish oil—short, castor oil—short, chinawood oil—very short, oiticica—extremely short, and synthetic resins—moderate. Mineral oils and aliphatic hydrocarbon solvents are in good supply, whereas aromatic solvents are short. Manganese paste dries and nonscratch compounds are in short supply.

* HOW TO CHOOSE THE RIGHT INK (First of two articles). George Welp. *American Printer* 132, No. 5, May, 1951, Pages 36-37 and 68 (3 pages). To provide the right inks, the ink supplier should know the process and type of press, material to be printed, kind of job, and number and rotation of colors if offset. For tin printing, inks must have the correct viscosity and high temperature resistance. For letterpress, the ink varies according to the type of press: platen, flatbed, rotary, or newspaper. Rotagravure printing requires ink formulated according to the speed and printing pressure. Aniline, steel die, and copper plate printing all should be clearly specified when ordering ink. Paper surfaces vary from glassine to newsprint; the ink needed varies likewise. The best method of getting the correct ink is to send a paper sample to the ink supplier. Tin printing, plastics, rubber, pliofilm, and cellophane printing all require special attention. Inks required for fabric printing vary with the kind, finish, and color of the fabric.

*HOW TO CONSERVE YOUR ROLLERS—THE BRIDGE FROM INK TO PAPER. E. B. Davis. *Inland Printer* 126, No. 6, March, 1951, Pages 34-36 (3 pages). Natural and synthetic rubbers for rollers are alreary on government allocation. To assure unbroken production, replacement rollers should be of the more durable types, and adequate supplies should be kept on hand. A roller caretaker provided with a place and materials to work with, should be appointed to keep rollers clean.

* INK PLANT OBSERVER. I. M. Bernstein. *American Ink Maker* 29, No. 6, June, 1951, Pages 45 and 63 (2 pages). This article is a continuation of the description of the Keenok Uniroll mill started the previous month. The ink requires only a single pass through this mill since impactoids are not formed. Since cleanup is difficult,

this mill cannot equal the operating flexibility of the three-roll mill. Advantages of the mill are in continuous operation for a particular color. This competitive challenge will tend to initiate further improvements in three-roll mill design.

* RECENT OIL AND COLOR DEVELOPMENTS IN GERMANY. *American Ink Maker* 29, No. 6, June, 1951, Pages 35-37 and 63 (4 pages). This article consists of abstracts of some of the papers presented at the German Chemical Society. The papers are: Recent Work on Auto-Oxidative Primary Phenomenon of Oil Drying by W. Franke; Elementary Phenomena in Oil Drying by W. Kern; Recent Developments in the Field of Polyesters for Lacquers and Varnishes by K. Hamann; Particle Size and Particle Shape of Pigments and Their Significance by Goeb; Measurement of the Light-Fastness of Ink and Varnish Pigments by Neugebauer; Photometric Fading of Mixtures of Berlin Blue and Zinc White by Haug; Thickness Measurements of Wet Films by Garmsen; and A New Analytical Method for the Oil Extraction of Pigment Pastes by Lenz.

Ink Troubles

* ADAPTING INK TO PAPER. Al Reynolds. *Share Your Knowledge Review* 31, No. 11, September, 1950, Pages 33-4 (2 pages). The problem of preparing ink for lithography on every kind of paper reduces itself to a few simple fundamentals. Paper is selected on cost and use requirement. Ink must be chosen to suit the paper. Some papers are unprintable by offset, but marginal papers cause most of the trouble. A plea is made for less tack in inks to provide more latitude. Most of the reduction should be done by the ink maker.

* INK FLYING — ITS CAUSES AND PREVENTION. Andries Voet. *Patra Journal* 13, No. 1, Pages 17-27 (11 pages). Ink flying is connected with ink transfer. In high speed printing, ink is drawn out in filaments against elastic forces acting in the liquid. After filament rupture the fractured parts retract on the roller in an exceedingly small period of time. Ink is ejected from the press when simultaneously multiple filament rupture occurs, leading to ink flying. Fractured filaments and ejected drops bear an electric charge which promotes ink flying. In water-in-oil types of emulsion inks the number of multiple filament breaks is greatly reduced, leading to reduced flying. Such inks have a markedly increased dielectric constant, resulting in reduced repulsive electric forces in the filaments. It has been possible to prepare satisfactory emulsion news inks, which show a markedly reduced tendency to flying. Such inks can be made on a commercial basis with the aid of certain long-chain non-aromatic amines.

* TIPS ON OFFSET INKS. Oscar Diehl. *Lithographers Journal* 35, No. 4, July, 1950, Page 7. There are no general instructions concerning ink consistency and requirements. Substances should not be added to inks indiscriminately. The hazards involved in so doing are discussed.

THE POWDERING PROBLEMS IN LITHOGRAPHY. W. H. Wass. *British Printer* 63, No. 377, March-April, 1951, Pages 36-39. The problem of ink powdering is based on the inter-dependence of paper and ink characteristics. The symptom of powdering is the inability of the printed image to resist disturbance by rubbing. It is caused by a separation of the vehicle and the pigment of the ink after printing, which results from a lack of balance between the oil-absorbency characteristic of the paper and the pigment-

retaining factor of the oil in the ink. If the ink and the paper used meet certain standards, a good printing job will result. Papers which possess an oil absorbency of 15 to 50 sec. according to the PATRA oil absorbency test are satisfactory. It has been found that the pH of the paper is also a relevant factor and that paper which has a pH of 5 or above is most successful. The procedure for testing the oil absorbency of paper is included. 2 figures. *Bulletin of the Institute of Paper Chemistry* 21, No. 8, April, 1951, Page 576.

Ink Testing

INK USERS' PROBLEMS AND THEIR SOLUTION. P. B. Mennel. *Paper Making and Paper Selling* 69, No. 1, 1950, Pages 11-13 (3 pages). Some of the major problems encountered by users of printing inks involve piling, powdering, lifting, backing away from the duct roller, offsetting, emulsification, bleeding, picking, and improper drying. These difficulties are discussed with regard to lithography, and remedies are suggested. The storage of offset inks is also mentioned, and it is pointed out that ink stocks should be carefully controlled, since ink which has hardened or gelatinized cannot be remilled to restore it to usable condition. The appearance on the litho market of machine coated papers, which are very absorbent and weak-surfaced, has necessitated the development of special inks. *Bulletin of the Institute of Paper Chemistry*, 20, No. 10, June, 1950, Page 738.

• THE NATURE AND ACTIVITY OF CARBON BLACK SURFACES. W. R. Smith and W. D. Schaeffer. *Rubber Chemistry and Technology* 23, No. 3, July-September, 1950, Pages 625-33 (9 pages). The differential heats of absorption have been measured by precision colorimetry for nitrogen and a series of C_4 hydrocarbons on a group of carbon blacks of varying reinforcing ability. In addition, the nature of the surface oxide complexes present on carbon blacks has been studied by means of their emission band spectra. Results and interpretations are given.

• A PARALLEL PLATE VISCOMETER . . . FOR PRINTING INKS. Andries Voet and John S. Brand. *American Ink Maker* 18, No. 9, September, 1950, Pages 28-31 and 59, 61 (6 pages). An ink drop of known volume or weight is placed upon a plexiglas plate and another plexiglas plate is dropped upon it. The "spread" of the drop between the plates is measured at various time intervals. The slope and intercept of the resulting linear (logarithmic) relationship permit an evaluation of ink flow properties.

BRITISH STANDARD FOUR-COLOR AND THREE-COLOR LETTERPRESS PROCESS INKS. British Standards Institution, British Standard 1480, September 21, 1949, 16 pp. Specifications are given for a four-color and a three-color set of letterpress process inks in terms of hue, color strength, and light fastness. Spectrophotometric curves and printed patches are included. Hue is determined by visual comparison of a dry print with the appropriate standard print. The color strength test is carried out by mixing the colored ink with zinc oxide and comparing the color strength with that of a master standard ink. The light-fastness of the printing inks is compared with that of the master standard by an accelerated exposure test for 100 hours at a distance approximately 12 inches from an enclosed carbon arc with an arc current of 10 to 14 amperes at 100 to 130 volts. *Monthly Abstract Bulletin* 36, No. 9, September, 1950, Page 431.

PRELIMINARY STUDY OF THE BEHAVIOR OF INK ON A PRINTING MACHINE USING THE 'INKOMETER' PRINCIPLE. C. C. Mill, E. R. Gates and

L. E. Lawson. *Patra Interim Rep.* No. 59, 1950, 11 pages, 6 figures. The torque operating on rollers rotating in contact with a film of ink has been measured. The torque is shown to be dependent on the speed of rotation, the pressure between the rollers, the quantity of ink and the nature of the ink. Only in the case of the speed of rotation is there a simple relationship with the torque. In experiments carried out over a long period the torque-time relation for inks is different from that for oils, although the temperature rise was substantially the same in all cases. Measurement of ink film thickness by means of a weighed roller placed in contact with a roller in the system indicated the possibility that the composition (Ideal) rollers carried more ink than the metal ones. The suitability of the Inkometer principle as a works control technique requires extensive records on a day-to-day basis to assess the importance of some of the smaller torque variations in practice. *Printing Abstracts* 5, No. 12, December, 1950, Page 537.

FUNDAMENTAL CONSIDERATIONS ON TACKINESS. Andries Voet. *Chemical Abstracts* 45, No. 5, March 10, 1951, Page 2257. Under static conditions a liquid adhesive reacts to stress by flow; under dynamic conditions its elastic reaction is more important. An app. is described which allows measurement of the energy of film sepn. under dynamic conditions by the energy loss of a cylinder rolling over an adhesive film. The adhesive energy per sq. cm. increases with film thickness and is proportional to the thickness of the transferred portion of the film; it depends on the nature of the surface and is proportional to the rate of film sepn. and the viscosity raised to the power 1.5; its logarithm is inversely proportional to the abs. temp. The elastic reactions are analogous to those studied by Mason (C.A. 42, 5291i). The elastic modulus is 10^7-10^8 dynes/sq. cm. for a time of sepn. of 10^{-3}-10^{-4} sec.

SOME UNSOLVED PROBLEMS IN THE PRINTING INK FIELD. Milton Zucker. *Paper Mill News* 74, No. 2, January 13, 1951, Pages 10-11. Discusses unsolved problems in the printing ink field and the variables encountered, such as tack, drying, rub-resistance, printability, ink body, press temperature, humidity, press speed, amount of ink, type of ink, pressure roller composition, distribution efficiency, paper composition of plate material, smoothness of plate surface and percentage of plate coverage. States there is no agreement on method for measuring tack of ink. The "Inkometer" by Dr. Reed of the Lithographic Technical Foundation distributed a given volume of ink on a roller in pivoted contact with a second roller, and the force involved was measured. The IPI (International Printing Ink) rotational Viscometer works on submerged unaerated (in which no air has been trapped) films, so that the results obtained can be translated into effectiveness on a press wherever the action of air current has a rapid action on a thin ink film. Dr. Andreas Voet has recently proposed a new theory of the relation of tack to printability and a new device for measuring it. On the question of drying ink, people have no agreement of what is meant by dry and by rub-resistance; "they are still uncertain about what conditions they are talking about." The many variables mentioned make it difficult to find the answers to correlate the data in ink distribution. The magnitude of the problem of printability will require research by the use of scientific techniques to determine, if possible, the elimination of these many variables. *American Newspaper Publishers Association* Research Bulletin 42, March 12, 1951, Page 34.

* INK FLOW ON ROTATING ROLLERS. Lars H. Sjodahl. *American Ink Maker* 39, No. 3, March, 1951, Pages 31-33 (3 pages). Ink flow as it relates to distribution of ink on a press, transfer to paper, and trapping over wet ink

is analyzed. Although viscosity and yield value are of primary importance, their determination by low speed, constant pressure instruments is believed inadequate. Finely dispersed air in the ink film and unrelaxed elastic forces in the ink in the nip are proposed as explanation of the difference between press results and viscosity measurements. The advantages and disadvantages of the Inkometer are discussed in light of the above.

INK ABSORPTION. *Patra News* No. 2, 1950. Studies on the rate of absorption of ink media with and without pigments indicate that penetration was more complete and took longer the greater the pigmentation; also that a medium of higher viscosity took much longer to begin to penetrate the paper and to penetrate it more completely. *American Ink Maker* 29, No. 4, April, 1951, Page 47.

PATRA REPORTS ON INK RESEARCH PROGRESS. *American Ink Maker* 29. No. 4, April, 1951, Page 49. A brief description of and background for projects in ink and color problems are given. Projects include: (a) Working Properties of Printing Inks (b) Behavior of Inks on Rotating Rollers (c) Drying of Inks (includes development of an instrument to measure initial rate of absorption) (d) Erratic Drying of Offset Litho Inks (e) Acid Papers and Ink Drying (f) Color Measurement and Fading (g) Color Control on the Printing Press.

Ink Drying

PROCESS OF PRINTING. Meyercord Company. *British Patent* 635,747. Printing ink of a type hardenable by sulphur dichloride is exposed to sulphur dichloride vapours. *Printing Abstracts* 5, No. 6, June, 1950, Page 263.

*INSTRUMENT FOR MEASURING THE DRYING SPEED OF PRINTING INKS. *Grafiska Forsknings-laboratoriet* 24, August, 1950, Pages 3-7 (5 pages) (In Swedish). An instrument for measuring the drying speed of printing inks has been designed and constructed at the Graphic Arts Research Laboratory. Experiments have shown that good reproducibility is achieved. Several inks or one ink on several papers can be tested at the same time. The design and function of the instrument is discussed.

* THE VISCOSITY OF LINSEED OIL LITHOGRAPHIC VARNISH FILMS DURING OXIDATION DRYING. W. H. Banks and P. B. G. Upton. *Journal of the Oil and Colour Chemists Association* 33, No. 363, September, 1950, Pages 397-410 (14 pages). Measurements of the changes in viscosity of a bodied linseed oil film during drying using a rolling ball technique are described. The viscosity shows negligible change for a period which is a considerable fraction of the drying time. Number average molecular weight changes during the drying process are consistent with the condensation of oxygen activated molecules to form a cross linked polymer in which the functionality of the active units is not in excess of three.

THE EFFECT OF DRYING AGENTS ON LITHOGRAPHIC OIL. Felix Wilborn. *Chem. Tech.* 2, 1950, Pages 123-5 (3 pages). A study of the effect of metal resinates as drying agents for lithographic oils (made by heating linseed oil) indicates that the order of efficacy is Co, Fe, Ce, Cu, Mn, Th, Pb, Ni, and Zn. The relation of drying time to percentage of drying agent is hyperbolic with the economic point at about 5% metal resinate which gives a drying time of 1.25 hrs. with the Co resinate and 2.75 hrs. with the Fe resinate on the test plates. *Chemical Abstracts* 44, No. 17, September 10, 1950, Page 8132.

*RAPID SETTING INK. *Chemical Industries* 66, No. 6, 1950, Page 824. *American Ink Maker* 28, No. 9, 1950, Page 40. A new ink designed for rapid setting without the use of heat is based on the equilibrium of a three component system. The ink is composed of a resin and two solvents, one of which is an alcohol. The resin itself is insoluble in either solvent alone, but soluble in a definite combination of both solvents. When this solvent balance is upset, however, the resin precipitates out, and the ink sets. In printing, one of the solvents of the ink is removed either through evaporation or absorption, thus readily upsetting the balance of the compound and causing setting. Press runs at 1,000 ft. per min. have been successful, but more favorable results are obtained using 15 to 20 per cent of scorch heat. The ink ultimately dries to a hard glossy film with good tone. *Printing Abstracts* 5, No. 10, October, 1950, Page 454.

CAN PAPER INFLUENCE THE DRYING OF PRINTING INKS? M. Hartmann. *Allg. Pap.-Rdsch* No. 23, December 7, 1950, Pages 1129-30 (in German). It is suggested that as printing inks appear to dry better on fully bleached lined carton board, the resin-like constituents left in incompletely bleached board may exert an anti-catalytic effect on the drying of inks, possibly due to the formation of phenols at the dry end of the papermaking machine. The rate of drying of inks also appears to increase with the uniformity of heating of the paper. It is, to a lesser extent, also affected by the moisture content of the board. *Printing Abstracts* 6, No. 2. February, 1951, Page 52.

DRYING OILS IN PRINTING INKS. I. M. Bernstein. *J. Am. Oil Chemists' Soc.* 27, No. 11, November, 1950, Pages 534-8 (5 pages). In a general analysis of the natural and synthetic drying oils used in the printing-ink industry, reference is made to the fact that tall oil is also employed, but in relatively small quantities. 2 tables and 7 references. *Bulletin of the Institute of Paper Chemistry* 21, No. 4, December, 1950, Page 274.

INK FLYING TESTS. *Mecmuasi* 15A, No. 1, 1950, Pages 65-81 (17 pages). Misting or ink flying can be measured by collecting the ink on cellophane, as it is ejected on passing from a revolving steel roller to a rubber covered roller, and weighing. Tests indicate that misting is reduced by leaving the ink on the rollers for periods up to one hour before operation. It is reduced also by increasing the carbon content of some inks, or by increasing the temperature. Increasing the amount of ink on the roller, or increasing the speed of rotation of the rollers tends to increase ink flying. There is no correlation between ink flying and viscosity of the ink. Misting inks show a marked reversible diminution of dielectric constant on shearing and high yield value. Non-misting inks show no change in dielectric constant, have low yield values, little tendency to agglomerate and a marked Brownian movement on dilution. *American Ink Maker* 29, No. 1, January, 1951, Page 38.

LITHOGRAPHIC DRYING OIL BASED ON POLYDIENES. A. I. Yurzhenko, N. I. Marchenko and O. L. Glushkina. The use of synthetic substitute for linseed oil, is described. The substance is polydiene, a low-mol. diene polymer from the by-products of synthetic rubber production. It forms film spontaneously at room temp. in 6-8 days, while addn. of 1.5-3.0% Mn-contg. drier reduces the time to 10-13 hrs. Ca and Co resinates are also effective. The crude product, as obtained from the plant, is polymerized somewhat further to secure more body for lithographic use; this is accomplished by heating at 150° with the above driers until desired viscosity is reached; if low color is desired the drier should not be added until after the thermal polymerization. Tests with offset process rubber sheets showed that very

little swelling of the latter occurs on immersion into the synthetic "oil". Color printing run on plant scale with the polydiene of 100 sec. viscosity as the pigment carrier (or binder) was highly satisfactory. *Chemical Abstracts* 45, No. 1, January 10, 1951, Page 365.

INK DRYING ON MACHINE-COATED PAPERS. *Patra Information Leaflet No. 39.* The information presented in the Patra Information Leaflet No. 39 is reprinted. This was compiled at a meeting of printing, papermaking, and ink-making members, who discussed ink quality in relation to the requirements of machine-coated papers. The difference between art papers and machine-coated papers is pointed out. It is concluded that problems should not be encountered, provided the printer uses an ink recommended by the inkmaker, in the prescribed manner. *Bulletin of the Institute of Paper Chemistry* 21, No. 6, February, 1951, Page 411.

APPARATUS FOR EFFECTING THE HARDENING OF DEPOSITS OF INK AND LIKE COMPOSITIONS. Jess D. Klopfenstein. *U. S. Patent 2,544,839. Official Gazette* 644, No. 2, March 13, 1951, Pages 459-60 (2 pages). In apparatus of the class described, driven means defining a backing surface on which sheet-like material may be moved, a housing having nested arcuate baffles providing parallel terminal edges closely spaced from said backing surface and defining therewith an inner treating chamber and an outer exhausting chamber in restricted communication with each other only at said terminal edges adjacent said backing surface, means for supplying a treating agent in vapor form to said treating chamber, means for withdrawing unused treating agent from said exhausting chamber and means carried by said driven means for engaging said sheet-like material to hold the same against said backing surface to expose only the opposite surface of said material to said treating vapor.

PROCESS OF DRYING PRINTING INKS. Clarke E. Thorp and Layton C. Kinney. *U. S. Patent 2,528,850.* The process of printing, which comprises depositing on sheet material an ink composition containing a fatty oil, and subjecting said freshly deposited composition to the action of sulphur dichloride vapors to harden said composition. *American Ink Maker* 29, No. 2, February, 1951, Page 59.

* INK DRYING PROBLEMS. Al Reynolds. *Share Your Knowledge Review* 32, No. 8, May, 1951, Pages 11-12 (2 pages). The influence of paper in ink drying problems may be ascertained by noting the relationship between grain direction and poorly dried streaks, the randomness of occurence of poorly dried sheets in a stock, the position on the sheets where poor drying occurs, and the relationship between printing form and poorly dried areas.

OXIDATION OF DRYING AND SEMIDRYING OILS. Vincent J. Keenan. *U. S. Patent 2,555,976.* 1. The method which comprises contacting an oil selected from the class consisting of drying and semi-drying oils with an oxygen-containing gas in the presence of a material selected from the group consisting of ketene, diketene and mixtures thereof and thereby effecting accelerated oxidation of said oil. *Official Gazette* 647, No. 1, June 5, 1951, Page 260.

Ink Control

* PRINTING INKS. *TAPPI* 33, No. 7, July, 1950, Pages 67A-9A (3 pages). A review of quality control tests used in ink manufacture. These include color and strength, consistency, specific gravity, and dispersion. The tests for printability on paper are discussed.

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* GRINDOMETER FUNDAMENTALS. W. C. Walker and A. C. Zettlemoyer. *American Ink Maker* 28, No. 7, July, 1950, Pages 31-4 and 55-7 (6 pages). Data obtained with the NPIRI Precision Grindometer have been examined. Little precision can be expected from particle counts. The most reliable value is the average of all available readings, and this value becomes more reliable as the number of readings is increased. Particle counts are not practical for control measurements.

Ink Metal Decorating

* INKS FOR METAL DECORATING. William E. Traub. *National Lithographer* 57, No. 12, December, 1950, Pages 34, 77-9 (4 pages). The properties of metal decorating inks are discussed. Viscosity is important in ink transfer. Ink film forming properties are important in producing adhesion, hardness of film, brilliancy of color, and low porosity. There is a trend toward the use of solvent drying instead of vehicle oxidation. Air circulation, time, and temperature are important variables in the drying operation. Important advances are the development of the two color metal decorating press and the web varnishing process. These processes eliminate double baking of the sheets. The pigment used depends on the end use of the product. Properties of light fastness toxicity, resistance to wear and food processing, and color are all important. The vehicle has to be balanced with the pigment to give the proper flow properties.

* SYNTHETICS HAVE TAKEN OVER. E. C. Haskell. *National Lithographer* 57, No. 12, December, 1950, Pages 30-1 (2 pages). Metal decorating material vehicles have changed from bodied linseed oil to various fast drying synthetic resins. The earliest synthetics were phenol-formaldehyde resins. Improvements in properties were obtained by using substituted phenols. Later maleic hard resins gave better color. Today unlimited numbers of alkyd resins are produced to give the desired coating properties. Precautions to be observed in the use of modern coating materials involve use of the proper thinner, avoidance of contamination by material from another run, control of baking temperatures, and rotation of inventory.

Ink Fluorescent

* APPLYING FLUORESCENT COLORS BY DUSTING. *Modern Lithography* 19, No. 2, February, 1951, Pages 39-41 and 101 (4 pages). Information about the technique of dusting daylight fluorescent colors in connection with lithographed material is given. Paper must have a hard, smooth, non-absorbent surface. Changes in press and bronzer equipment are recommended to handle fluorescent size and powder. Printed size film thickness should be 0.0002", and dusted film thickness 0.002". Copy designed for maximum effectiveness and light stability is described.

* PROGRESS REPORT ON FLUORESCENT LITHOGRAPHY. Dan J. Terra. *Modern Lithography* 19, No. 2, February, 1951, Pages 32-4 (3 pages). The three types of luminescent materials are described. Radioactive compounds are of no importance in lithography. Phosphorescent compounds, which exhibit afterglow, are gaining in importance. They lose intensity upon being ground into inks; so must be dusted on. Fluorescent chemicals which glow only under black (near ultra-violet) light can be ground into inks. This medium is used for instrument dashboard lighting, outdoor posters, window display advertising, military maps and charts. Daylight fluorescent pigments besides having reflective color, transform the ultraviolet portion of daylight into visible color. They require a heavy film deposit; so they are applied either by silk screen process or by dusting.

Paper — General

MOISTURE INDICATOR FOR WEBS. E. I. DuPont de Nemours and Company and J. S. Seney. *Official Gazette* 634, No. 3, May 16, 1950, Page 902. *United States Patent 2,508,045.* A moisture measuring system for travelling webs comprises a pair of conducting members insulated from each other over which the web is passed in succession, a condenser, a direct voltage source, means connecting the source in series circuit with the condenser and with the members so that the electrical resistance of the web between the members controls the rate of charge of the condenser, means responsive to the condenser voltage to discharge the condenser when its charge reaches a predetermined value, whereby the condenser repeatedly charges and discharges in a cycle, the frequency of which is a function of the moisture content of the web, and means responsive to the condenser and measuring the frequency.

PRE-CONDITIONED PAPER. H. Radford Russell. *Pulp and Paper* 24, No. 7, June, 1950, Pages 99-100 (2 pages). *Paper Mill News* 73, No. 22, June 3, 1950, Pages 11, 14 (2 pages). The cycle conditioner is described which was developed by the Everett Pulp and Paper Co. in cooperation with the J. O. Ross Engineering Corp. It consists of a cold chamber and a conditioning chamber with recirculated, high humidity, warm air; the web makes four passes through both units (from the cool to the warm chamber) and leaves the conditioner by way of the cool chamber before being wound in a roll. The paper is usually shipped with 5.5% moisture. 1 diagram. *Bulletin of the Institute of Paper Chemistry* 20, No. 11, July, 1950, Page 802.

IMPROVING THE QUALITY OF PAPER FOR OFFSET PRINTING. E. M. Beckman. An outline is given of the basic operating conditions for the successful manufacture of offset paper. The fibres are shortened just enough to produce a paper of uniform texture. In order to reduce dusting, it is recommended that 1% of starch be added to the pulp in the form of size. For the production of a paper with good formation characteristics, the stock consistency at the head-box should be 0.55-0.75% for paper with a weight of 70-100g./sq.m., and 0.75-1.0% for a weight of 100-160 g./sq.m. It is expedient to increase the orientation of fibres in the machine direction in order to improve the dimensional stability of the paper; to accomplish this end, the discharge of pulp to the wire should be maintained at a somewhat lower rate than the speed of the wire. Depending upon given production conditions, the operation of the shake should be held within the following limits: amplitude, 3-6 mm., and frequency, 200-250 shakes per minute. The surface temperature of the driers should increase gradually from one drier to the next, so that the temperature of the first drier after the press does not exceed 50° C. to reduce cockling of the wet offset paper, the maximum tension should be maintained on the drier felt. In slitting offset paper, it is essential for the length of the finished sheet to correspond with the machine direction of the paper. *Printing Abstracts* 5, No. 12, December, 1950, Pages 539-40.

PRESENT DAY PRINTING PROCESSES AND PAPER. F. B. Meech. *World's Paper Trade Review* 135, No. 5, February 1, 1951, Pages 317-322, 327-332. The author describes the fundamental characteristics of the various current printing processes, including letterpress, lithography, photogravure and its modifications, the Henderson and Dultgen processes, and two electrical processes, onset or electronography and xerography, in which the paper and printing plates are not brought into direct contact. The requirements of paper are discussed in relation to these processes, and methods of measurement are reviewed which have been proposed for evaluating

smootness, absorbency of paper and drying of inks, picking and fluffing, moisture stability, optical properties, abrasiveness, compressibility, and tarnishing and fading of colored inks. Brief reference is also made to the peculiar requirements of heat-set and moisture-set letterpress, xerography, and electronography. Certain paper properties can be accurately measured, and a fair estimate of their probable effect on the printed sheet made; in other cases only a comparison with a sample is possible. The necessity of matching the paper to the printing process and ink is largely occasioned by the fact that they come into contact in the conventional printing processes. In this respect, xerography and electronography may present a real challenge. 2 figures and 18 references. *Bulletin of the Institute of Paper Chemistry* 21, No. 9, May, 1951, Page 642.

* PAPER FROM STRAW. C. W. Tabb. *Modern Lithographer and Offset Printer* 47, No. 4, April, 1951, Pages 74-75 (2 pages). The author expresses a favorable view of the present and future position of straw as a paper-making raw material. He claims that straw pulp can be made white, free from shives, fiber bundles, and lumps, of high strength, and which aids formation and saves beating power. Printings particularly suited for offset are made containing 80-90% of straw pulp.

Paper Coatings

* THE PREPARATION OF A WATER-RESISTANT STARCH COATING BY THE USE OF ANTIMONY SALTS. N. M. Frisch, M. L. Cushing, and L. Gussman. *Tappi* 33, No. 7, July, 1950, Pages 328-32 (5 pages). Potassium pyroantimonate ($K_4Sb_2O_7$) (I) greatly increases the water resistance of clay-starch paper coatings. Normally about 10% of I, based on the starch, is required. High degrees of starch conversion necessitate larger amounts of I. Chlorinated starches give poorer results. In preparing the coating I is added immediately after the pigment and adhesive have been blended; defoamer and plasticizer, if necessary, are added, and pH is adjusted to 7.0-7.7. For best results, the coating should be dried at 220° F. for 30-120 sec. Apparently I insolubilizes starch by H-bonding. *Chemical Abstracts* 44, No. 22, November 25, 1950, Page 11092.

*COATING PAPERS ON THE FOURDRINIER AND PRESS SECTIONS. C. W. Steele. *Paper Trade Journal* 131, No. 21, November 23, 1950, Pages 30, 32-4 (4 pages). There is an increasing demand for lightweight coated papers because of their reduced weight and bulk per ream. A 4 lb. coating on 18 lb. rawstock can be made by application on the dandy roll and in the press section of the fourdrinier machine. Advantages claimed for the process are reduced wire wear, pitch troubles, fiber sticking on presses, loss of filler, two-sidedness and increased machine speed.

* DEVELOPMENTS IN PAPER COATINGS. C. E. Fawkes. *Modern Lithographer* 19, No. 3, March, 1951, Pages 30-33 (4 pages). Paper coatings are applied for surface decoration, surface protection, and to add functional properties to the front or back surface of the sheet. Surface decoration may be used to make the surface glossy or lustreless, to equalize lustre between ink and paper, and to add an additional color. Surface protection may be abrasion resistance, high temperature resistance, sparness (resistance to marking by liquids), weatherproofing, greaseproofing, or cleanability. Functional coatings may impart water vapor impedance, flavor barriers, resistance to sticking in hydraulic pressing and molding, resistance to the action of soaps, detergents, and alkalis, and heat sealability. Methods of applying coatings are mentioned.

METHOD OF COATING CONTINUOUS WEBS OF PAPER OR THE LIKE. Harry W. Faeber. *U. S. Patent 2,555,536.* 1. A method of coating a web of paper or the like with a plurality of films of coating material to form a composite, uniformly distributed layer of coating material upon said web, which comprises forming first and second films of coating material, said second film being thinner than said first film, uniformly and separately distributing said first and second films, dividing said first film into a third film and a fourth film, said fourth film being of lesser thickness than said third film, applying said fourth and third film successively to said web, and finally applying said second film to said web. *Official Gazette* 647, No. 1, June 5, 1951, Page 145.

Paper Selection

• THE JOB DETERMINES THE PAPER: PRACTICAL PAPER PROBLEMS SERIES NO. 3—ORDERING PAPER IN ROLLS. Charles V. Morris. *Printing Magazine* 74, No. 7, July, 1950, Pages 32, 33 and 56 (3 pages). The production processes to which roll paper is exposed are radically different from sheet fed operations. There are no established standards for paper in rolls; because every order for paper in rolls is tailormade. The selection of the paper should be determined by the speed of the press by the number of operations —after printing—the paper must endure; the kinds of ink, the number of colors to be applied one over the other, the amount of coverage, whether or not printing is on one or two sides of the sheet, and the quality of the results desired.

WHAT PAPER, FOR WHAT PROCESS—AND WHY? W. R. Thraill. *Proc. Tech. Sect. Brit. Pap. Bd Mkrs' Assn.* 30, No. 2, 1950, Pages 437-41 (5 pages), Discussion Pages 442-4 (3 pages). The requirements of the printer in regard to rosin sizing, strength, smoothness, moisture content, avoidance of strike-through, set-off and show-through, uniformity of thickness, avoidance of picking, fluffing and two-sidedness, dimensional stability, machine-coated paper for magazine printing, litho papers, and photogravure papers are discussed. *Printing Abstracts* 5, No. 11, November, 1950, Page 500.

• PAPER SELECTION. Robert P. Long. *Modern Lithography* 18, No. 8, August, 1950, Pages 34-5 and 95 (3 pages). Results of a survey show that the lithographer selects more than 90 per cent of his paper and the customer less than 10 per cent. The figures vary somewhat with different types of paper, namely; Regular Offset, Coated Offset, Bond and Ledger, and Label. Advantages of paper selection by the lithographer are given.

Paper Troubles

• COATED OFFSET PAPERS. *American Pressman,* 60, No. 9, August, 1950, Pages 18 and 46 (2 pages). The following problems are discussed: (1) Letterpress Coated Papers on Offset, (2) Production, and (3) Quality of Print. Some of the factors that influence the quality of print are: Excessive ink, excessive water, excessive impression, blanket not in good condition, cylinder settings and packings not close enough to perfection to obtain uniform surface travel and stocks not suited to offset printing even though they are made and sold for this purpose.

• A METHOD FOR STUDYING THE DISTRIBUTION AND SIGN OF STATIC CHARGES ON SOLID MATERIALS. Harry H. Hull. *Journal of Applied Physics* 20, No. 12, December, 1949, Pages 1157-9 (3 pages). A specia'

powder is used to show how static electricity is distributed on materials such as paper. Red particles of this powder are attracted to negatively charged areas. Paper from heatset printing presses shows streaks of static electricity generated by idling rollers and shifting patterns of static electricity generated in the folder, often with opposite charges on the same sheet of paper. 2 figures and 5 references. *Bulletin of the Institute of Paper Chemistry* 20, No. 10, June, 1950, Page 745.

THE PROBLEM OF CURL. August S. Erspamer and William D. Rice. *Paper Mill News* 73, No. 28, Pages 76-8 and 88 (4 pages) July 15, 1950. The authors discuss the different forms of curl (moisture curl, inherent curl, and structural curl), their causes, the way in which they manifest themselves, and methods of correction or, preferably, prevention. The use of various external devices for moisture addition or conditioning seems to receive increasing interest and consideration. Such equipment should be viewed as a last resort, because it is far more desirable to retain moisture than to replace it. 6 figures and 8 references. *Bulletin of the Institute of Paper Chemistry* 20, No. 12, August, 1950, Page 880.

* PROBLEMS A PRINTER MEETS IN COATED PAPER AND THE SAFEST WAYS FOR HANDLING THEM. Forrest Rundell. *Inland Printer* 126, No. 1, October, 1950, Pages 63-5 (3 pages). Some of the problems and pitfalls encountered in printing glossy-, dull-, and cast-coated papers are discussed, and suggestions for their avoidance or remedies are listed. *Bulletin of the Institute of Paper Chemistry* 21, No. 4, December, 1950, Page 251.

* PAPER AND PRINTING PROBLEMS FROM THE STANDPOINT OF THE MERCHANT AND PRINTER. W. H. Bureau. *Tappi* 33, No. 11, November, 1950, Pages 104-5A (2 pages). The author gives examples of general difficulties in the use of paper by the printer under the subdivisions of: the wrong paper selected for the job; lack of complete information concerning paper requirements; proper paper selected but actual delivery unsatisfactory; difficulties attributed to either printing operations or inks; and unexpected difficulties originating from an unusual combination of circumstances. Possible remedies for these difficulties and the prevention of their occurrence are discussed. *Bulletin of the Institute of Paper Chemistry* 21, No. 4, December, 1950, Page 262.

Paper Testing

*PAPER TESTING WITH SHOP MATERIALS. René Graf. *Fachhefte* 4, 1950, Pages 121-5 (5 pages) (In German). Paper can be evaluated for printing purposes by simple methods at low cost with materials easily available. The tests described are: surface appearance, felt and wire sides, whiteness, machine direction, formation, transparency, permanence of watermark, thickness, basis weight, rub-resistance, smoothness, moisture content, abrasive quality, expansivity, presence of ground wood, degree of sizing, type of sizing, number of plies (cardboard), absorbency, lightfastness, pick-resistance, coated papers, grease resistance, and yellowing.

* THE MEASUREMENT OF OPACITY AND REFLECTIVITY FOR PRINTING PAPERS. V. G. W. Harrison and S. R. C. Poulter. *Paper Maker and British Paper Trade Journal* 19, No. 6, June, 1950, Pages 416-18 and 420 (4 pages). As a printing material, paper suffers from the drawback that it is translucent. This may cause printed matter to appear through the reverse side of the sheet and the resultant "show through" is objectionable, particularly when both sides of a sheet are printed. An instru-

ment is described that measures the tendency of a sheet toward "show through". The opacity of the paper measured is expressed in terms of contrast ratio or printing opacity. The percentage is zero for a perfectly transparent paper and 100 percent for one that is quite opaque. The construction of the instrument is described as well as a comparison with visual grading by trained observers.

* PREDETERMINING PRINTABILITY. K. B. Latimer. *Paper Maker and British Paper Trade Journal* 120, No. 2, August, 1950, Pages 103-4 and 114 (3 pages). Research is being carried out by Time Inc. whereby printability of paper can be predicted more accurately. Paper smoothness is measured by a sensitive stylus passed over the paper, thus measuring the average variation in hills and valleys of the paper. Ink receptivity is tested on a press and it has been decided that this problem is with the paper rather than one of ink or platemaking. Measurement of paper resilience is accomplished by a special micrometer which can measure the original caliper of paper, the caliper of the paper under 250 pounds pressure and the caliper after such pressure has been released. Moisture content of paper is responsible for some printing troubles. Brittleness of paper is the result of too low a moisture content whereas too much moisture increases the drying time of the ink. Too much water in the paper will also cause ink blistering.

* TESTING MOISTURE CONTENT OF PAPER. Charles F. King. *Inland Printer* 125, No. 6, September, 1950, Pages 73-5 (3 pages). The lithographer is interested in paper stability under pressroom conditions and not in its percent moisture content. Use of the Cambridge Sword and the LTF Paper Hygroscope for determining the paper condition is described.

THE PHYSICAL PROPERTIES OF PAPERS FOR SPECIAL PURPOSES. T. J. Bowditch. *Proc. Tech. Sect. Pap. Mkrs. Assn.*, 30, No. 2, November, 1949, Pages 383-9 (7 pages). Absorbency, permeability, bulk, strength, optical properties and permanence of paper are briefly discussed. The properties required in paper for specific printing and packaging applications are stated. *Printing Abstracts* 5, No. 11, November, 1950, Page 499.

EVALUATION OF THE SURFACE BONDING STRENGTH OF PAPER. J. A. Van Den Akker and W. A. Wink. *Proc. First Annual Tech. Meeting, Tech, Assoc. Lithographic Ind.* 1949, 7 pages; discussion 1 page. Tests for measuring the surface bonding strength of paper, which relates to the resistance of paper to picking in the printing operation, are discussed, and a new method is described. Tests in which a transverse force is applied to blocks cemented to the paper would seem to have merit in principle, but are not accurate because the cementing operation modifies the paper, and because localized stress concentration during the application of the load introduces a hidden error; moreover, the stress concentration involved does not simulate that existing in a nip of a rotary press. The friction tape and "Scotch tape" tests are useful in the hands of experts for the subjective evaluation of the surface bonding strength of paper, but fail to prove a numerical measure of this property. There is almost no fundamental basis for the wax pick test, which is widely used. In the hands of expert operators of good judgment, this test is useful as a guide, but results obtained with the test correlate only crudely with actual performance and, in some cases, the results can be very misleading. In consideration of these difficulties with existing methods, an apparatus for the measurement of the "viscosity-velocity product" (VVP) has been developed. In the new method, the stress which ruptures the paper surface arises in

high rate of shear of a viscous film, which is quickly applied to and removed from the paper under carefully controlled conditions which closely simulate the disruptive action occurring in the operation of a rotary press. The apparatus for the development of the method and new equipment currently under design are described. 1 table, 5 figures, and 3 references. *Bulletin of the Institute of Paper Chemistry* 21, No. 4, December, 1950, Pages 258-9.

THE PRINTING REQUIREMENTS OF PAPER AND THEIR EVALUATION. E. Rupp. *Allg. Papier-Rundschau* No. 5, March 8, 1951, Pages 146-7, in German. The usual paper-testing procedures—although they supply certain valuable information—do not indicate the suitability of a paper for a special printing process. Printability is not a single characteristic, but depends upon certain mechanical, optical, and electrical properties of the paper, as well as upon the interaction between paper and printing ink. The author discusses smoothness, porosity, tendency for dusting, uniform thickness, elasticity, edge stiffness, and dimensional stability as important mechanical properties, and freedom from dirt and spots (including freedom from harmful abrasive particles), whiteness, gloss, and transparency or opacity as outstanding optical characteristics; instruments used for testing these properties are mentioned. With regard to the interaction between paper and ink, the tendency for picking, receptivity of the paper for the ink, drying of the ink, and tendency for strikethrough are discussed. Strikethrough does not depend upon a single paper property but upon the sum of several properties, the most important of which are probably porosity and wettability by the printing ink. Suitable methods for the evaluation of strikethrough have yet to be developed. Mention is made of the troubles caused by static electricity, but the problem is not further discussed. 4 figures and 10 references (exclusively to European testing methods and instruments). *Bulletin of the Institute of Paper Chemistry* 21, No. 9, May, 1951, Page 640.

Lithography — General

* HADEGO PHOTOCOMPOSITOR FOR DISPLAY WORK. G. M. Van Wagtendonk. *Printing Equipment Engineer* 78, No. 1, April, 1949, Pages 38 and 39 (2 pages). The Hadego Photocompositor described is designed for offset and gravure display-type composition. It will produce either positive or negative transparencies and can be used as a step-and-repeat machine. The entire "matrix" line is photographed in one exposure. The matrices are plastic blocks which have a chemically affixed image on the face and are hand set in a composing stick in a fashion similar to the Ludlow hot-metal machine. *Monthly Abstract Bulletin* 36, No. 5, May, 1950, Page 224.

*PROFITABLE PLANT LAYOUT. Melvin Magnuson. *Pacific Printer and Publisher*, 84, No. 5, November, 1950, Pages 22-3 (2 pages). The basic principles of efficient plant layout are enumerated. Stress is laid on making a complete analysis of the plant's current operations by the use of scale drawings and flow charts. New flow charts are prepared to correct any deficiencies in the present system and to accommodate new business and equipment. Actual layout is made on a special table with templates at ¼" scale from which drawings at ⅛" scale are made for blueprinting.

* CHROMIUM DERMATITIS. Martin Leeden, *Modern Lithographer and Offset Printer* 64, No. 11, November, 1950, Page 216. Chromium poisoning is a selective occupational hazard in lithography which forces the victim eventually to change occupations. End of this hazard may be in sight if information published by Patra and LTF is true and is used. Patra claims in information leaflet #38 that bichromates in fountain solution can cause scum in absence of gum or similar material. In its instruction bulletin #801 LTF claims that bichromates are not needed in etches if cellulose gum is used.

*HOW TO SIMPLIFY WORK IN A LITHOGRAPHIC PLANT. Frank A. Myers. *Modern Lithography* 18, No. 11, November, 1950, Pages 36-8 and 107, 109, 111 (6 pages). The principles of work simplification as originally set forth by A. H. Morgansen are set forth. The importance of obtaining acceptance of new ideas and developments is stressed. Some work simplification schemes are illustrated in seven charts.

PHOTO-LITHOGRAPHY TODAY. A. B. Woodruff. *British Printer* 63, No. 375, November-December, 1950, Pages 44-9 (6 pages). Following a brief history of lithography, the latest developments in the field are discussed. A description is given of various problems being studied (including the limitations of paper and the elimination of static electricity), and some of the new fields open to lithography are enumerated. 3 illustrations. *Bulletin of the Institute of Paper Chemistry* 21, No. 4, December, 1950, Page 264.

* LITHOGRAPHIC TECHNOLOGY MOVES AHEAD. PART I. Frank A. Myers. *National Lithographer* 58, No. 1, January, 1951, Pages 26-7 and 82-3 (4 pages). The advances in the technology of lithography in the last 15 years are described. They include improvements in color transparency processes, cameras, lamps (colored fluorescent and arc), exposure timers, densitometers, lens stops masking, color separations, paper and plastic plates, bimetallic plates, etching, sensitivity guide, whirler motor timers, air conditioning, plate coaters, gum and the use of cronak and brunak treatments.

* LITHOGRAPHIC TECHNOLOGY MOVES AHEAD. PART II. Frank A. Myers. *National Lithographer* 58, No. 2, February, 1951, Pages 32-3 and 90 (3 pages). Recent improvements in lithographic technology are mentioned. Research work now being done is also discussed. It includes ink fountain key dials, plate packing height, blanket thickness measurement, standardization of varnish consistencies, paper problems, inkometer improvement, color matching and a proofing roller. Work simplification and process integration are mentioned.

* LTF STUDIES ALTERNATE MATERIALS AND METHODS IN ALCOHOL SHORTAGE. *Modern Lithography* 19, No. 3, March, 1951, Page 40. Isopropyl alcohol (99%) may be used in deep etch platemaking. The current shortage is due to lack of caustic necessary for dehydration and will therefore probably be temporary. Furfuryl alcohol may be used, but has a bad odor. The only immediately available alcohol is high priced grain alcohol. Other alternatives are to use an LTF method of making deep etch plates using a moisture removing lacquer and water instead of alcohol or conversion to albumin plates using LTF's latest methods.

* TRAINING IS THE KEY (Part One). Lawrence Brehm. *Modern Lithography* 19, No. 6, June, 1951, Pages 44-46 and 131 (4 pages); *Printing Magazine* 75, No. 6, June, 1951, Pages 40-42 and 80 (4 pages). The key to the problem of rising production and material costs is training. The Western Printing and Lithographing Company's Technical Institute trains not only apprentices but also sales, estimating, and production keymen, foremen, and assistant foremen. Training must be geared to the times. Salable work must be done by the apprentice as soon as possible. It is to the best interests of apprentices, tradesmen, trade organizations, and employers to have tradesmen competent. Proper selection of employees is important to the job applicant, employer, and union in getting the right people on the job. The applicant's physical and mental condition, education, and natural aptitudes should be known. Apprentice trade training is largely accomplished on the job, but learning is accelerated by supplemental training "off the job". In order to avoid distractions from other workmen and regular production, most off-the-job training is on an overtime basis. Flexibility is obtained by giving secondary training on two additional machines. Full-time instruction is given only to the lithographic artist group.

New Developments

* A REVIEW OF RECENT PROGRESS. Michael H. Bruno. *Modern Lithographer* 18, No. 7, July, 1950, Pages 36, 91 (2 pages). A summary of new developments — phototypesetting, electronic color separating devices, bi-, tri-, and poly-metal plates, Cronak, Brunak, CMC, Sensitivity Guide and others are discussed.

* RECENT DEVELOPMENTS IN OFFSET LITHOGRAPHY. Robert F. Reed. *Western Printer and Lithographer* 7, No. 1, October, 1950, Pages 44-5 and 50 (3 pages). A survey of the more important developments in recent years is given. One development is the reduction of hand color correction methods by use of masking methods, densitometers, and electronic color separators. Photo-typesetting machines are now being offered since problems of versatility, justification and correction have been solved. Plate life has been increased by use of bi-metal plates, cellulose gum, and Cronak and Brunak treatments. Developments in dampening mechanisms, arcs, and improved coated papers are mentioned.

• FINISH FOR ALUMINUM. *Chemical and Engineering News* 29, No. 2, January 8, 1951, Page 144. A new material for finishing aluminum, either as a base for paint or to protect the bare metal from corrosion, has been announced by the Chemclean Products Corp. The material is provided already mixed (6 oz/gal. of water) and the plate is immersed in the solution at 185° F. for 5 minutes. The solution is "self-cleaning". Details of the process are not given in this brief article.

Tone and Color Control

• COLOR CONTROL IN LITHOGRAPHIC PRINTING. Louis Pollner. *Modern Lithography* 18, No. 8, August, 1950, Pages 44-7 (4 pages). A paper presented at the second annual TALI meeting April 25, 1950, in Rochester, N. Y. An account of the color control in lithography project carried out at LTF. The author includes a summary giving a comparison of some of the available color measuring instruments.

• TONE FIDELITY: THE AIM OF LITHOGRAPHY. Stuart J. Canter. *American Printer* 131, No. 3, September, 1950, Pages 43-4 (2 pages). A brief summary of some of the factors or variables in camera and platemaking affecting tone reproduction in the lithographic process. Some of LTF's developments for lithography, such as Cronak, Brunak, Sensitivity Guide, Inkometer, and Cellulose Gum, are discussed, and mention is made of their role in tone reproduction.

Lithographic Troubles

• SCUMMING AND TINTING NOT CAUSED BY SAME CONDITIONS. *Printing Magazine* 74, No. 7, July, 1950, Page 48. Scumming and tinting are two effects in lithography that are frequently confused. The difference between the two is explained as well as the cause. A short discussion is included on the water-in-ink and the ink-in-water types of emulsions. The latter type is the main cause of tinting on a lithographic plate.

• SOME LITTLE CASE HISTORIES. Charles F. King. *Inland Printer* 127, No. 2, May, 1951, Pages 37-39 (3 pages). The author describes several little case histories of problems traceable to minor differences from conventional practice in the way in which the craftsman performed his task. Case 1: Albumin plate blamed; failure was caused by failure to remove developing ink. Case 2: Yellow ink blamed for plates going blind; failure caused by pitted dirty hot-spot eliminator on the arc lamp giving incorrect exposure. Case 3: Offset was caused by wet spray forcing the sheets together and dampening the ink, hindering drying. Changing the direction of spray cured the problems, but adjustment of the ink was used since the spray equipment manufacturer recommended aiming the spray straight down.

• ABOUT THE ORIGIN TO "GHOST PRINTING." *Grafiska Forshningslaboratoriets* 26, May, 1951, Pages 65-67 (3 pages) in Swedish. When box board is printed by offset, a weak image of the print, which is not caused by set-off, often appears on the back of the sheet, so-called ghost printing. It was found that this image is caused by volatile fatty compounds in the ink, which condensate on the back of the overlying sheet in the pile. The phenomenon occurs also when there is a small space between the sheets. It was found that especially the driers contain such volatile substances.

•AVOID DICHROMATES IN LITHOGRAPHIC FOUNTAIN SOLUTIONS. *PATRA Information Leaflet* No. 38, September, 1950, Page 1. A recommendation

that Dichromates not be used in fountain solutions, since their use allegedly causes scumming. Phosphates, gum and cellofas (cellulose gum) were found to be helpful.

Press Equipment and Methods

SHEET FED OFFSET PRINTING MACHINE. Sperry Corp. and E. G. Staude. *Official Gazette* 633, No. 1, April 4, 1950, Page 188. *United States Patent 2,502,806.* The machine has a cylinder having means thereon for engaging a sheet wrapped circumferentially about the same, means for moving the cylinder through an orbital path with a simulated rolling motion, a second cylinder including means for carrying an inked impression, means for moving the second cylinder through an orbital path with a simulated rolling motion and in the course of which the second cylinder is in rolling contact with a sheet wrapped about the first mentioned cylinder throughout only a portion of the movement of the cylinders through their respective paths for transferring the inked impression to the sheet, and a flat bed device positioned to be rollingly contacted by the second cylinder while the latter is out of contact with the first mentioned cylinder for producing the inked impression on the second cylinder.

PERFECTING OFFSET PRESS. Howard A. Pritchard. *Official Gazette* 636, No. 3, July, 1950, Page 837. *United States Patent Number 2,515,355.* In a sheet fed perfecting offset press, two printing units each comprising plate and blanket cylinders of the same size in vertical alignment and an impression cylinder of double size, the impression cylinder of each unit being disposed below the axis of the blanket cylinder on the side thereof toward the other unit, the impression cylinders of both units having two sets of sheet grippers, the impression cylinders and their grippers being so disposed that the grippers of the first unit impression cylinder transfer sheets directly to the gripper of the second unit impression cylinder.

*AN APPROACH TO PERFECT REGISTER. Stanley A. Crane. *Modern Lithography* 18, No. 9, September, 1950, Pages 53-4 and 155 (3 pages). For truly fine color work, too much emphasis cannot be placed on the importance of accurately placed register marks. Register marks should be about .003 inches thick, and so accurately placed that the markings on all separations are in exact correspondence with each other and with the marks placed on the original subject.

*LITHO PRODUCTION CLINIC. Theodore Makarius, *Modern Lithography* 18, No. 10, October, 1950, Pages 56-7 and 135 (3 pages). First of a series of articles on the operation of the offset press. Goes through various procedures for setting up a press before a run. Covers roller assembly, setting bearers and clearance between bearers of the plate and blanket cylinder on various types of presses. Points out method for determining the under cut of the cylinders.

*LITHO PRODUCTION CLINIC. Theodore Makarius. *Modern Lithography* 18, No. 11, November, 1950, Pages 47-8 (2 pages). Second in a series of articles on handling of a job on the press. This article discusses the factors to be considered in mounting the plate on the press and in setting rollers. The importance of accuracy in measurements and adjustments is stressed.

* SETTING ROLLERS. Theodore Makarius. *Modern Lithography* 18, No. 12, December, 1950, Pages 51, 95, 97 (3 pages). Setting form rollers of a press should be done with a long feeler gauge of .006 inch thickness rather than by means of paper strips. Gauging roller

settings by dropping inked rollers on the dry plate can give false settings. After setting form rollers the intermediate rollers are set. Special treatment should be given to leather covered intermediate rollers. Ductor rollers require special care when setting to insure even ink distribution. It is very important that the ductor is parallel to the vibrator.

* GRAIN WEAR. E. Tongue. *Modern Lithographer and Offset Printer* 47, No. 1, January, 1951, Pages 13-14 (2 pages). Grain wear is discussed in the light of press conditions. The effect of incorrect settings of water and ink rollers, and the packing of plate and blanket cylinders on grain wear is presented and investigated.

*A SWISS INVENTION—JET DAMPENING FOR THE OFFSET PRESS. Hirt and Wagner. Fachete 1, 1951, Pages 28-32 (5 pages) (in German). Dampening, an important process in planographic printing, has often been discussed. As the first technical journal, we are happy to report to our readers the invention of a Swiss technique which solves the problem in a new way. Thanks to generous cooperation from many sides, we were able to follow the frictionless functions of the new-type dampening system in actual operation in the pressroom. From this observation, we are convinced that this dampening system will gain acceptance in the pressroom, and that the Swiss therewith have rendered a valuable contribution towards increasing the quality of planographic printing.

* FOUNTAIN SOLUTION — WHAT pH? *Graphic Arts Monthly* 23, No. 5, Pages 72, 74, and 134 (3 pages). By using LTF's developments in plate treatments, a higher pH, less gum in the fountain solution, and less fountain solution on the plate may be used. This will result in increased plate life, brighter and cleaner colors, reduced drying problems, and better halftone printing. Recommended pH is 5.5 to 5.0 with reductions in pH and increased gum only used when necessary for a heavy form, heavy ink coverage, if counteretching develops on a multicolor press, or for weather conditions. Dirty dampeners cause scum, image spread, and trouble in keeping fine reverse lettering open.

SHEET FED OFFSET PERFECTING PRESS. Charles W. Harrold and Alfred S. Harris, *U. S. Patent 2,540,667. Official Gazette* 643, No. 1, February 6, 1951, Page 215. In a perfecting offset press, two blanket cylinders disposed side by side in impression relation to each other, sheet grippers on at least one of said blanket cylinders, plate cylinders disposed above the axes of said blanket cylinders, inking mechanism disposed above each of said plate cylinders, a stripper cylinder disposed above said blanket cylinders between said plate cylinders adapted to take sheets from a gripper equipped blanket cylinder, a feeding cylinder for feeding sheets to a gripper equipped blanket cylinder at a point below the axis thereof, and means for holding the sheet away from the other blanket cylinder until the impression line between blanket cylinders is reached.

ROTARY OFFSET SHEET PERFECTING PRESS. Howard A. Pritchard. *U. S. Patent 2,540,690. Official Gazette* 643, No. 1, February 6, 1951, Pages 220-1. In a perfecting offset press, two printing units each having an impression cylinder, an offset cylinder and a plate cylinder, the axes of the cylinders of each unit intersecting the points of an inverted triangle the base of which is longer than the sides thereof and joins the impression and plate cylinders, the offset cylinder of each unit being disposed below the base of its triangle and the plate cylinders being the highest cylinders in their respective units, and being disposed at the remote ends of

the triangles, inking mechanism disposed above each plate cylinder, sheet conveyor means for feeding sheets downwardly between said units onto one of said impression cylinders, means for transferring each sheet to the other impression cylinder and delivery means for withdrawing each sheet from the lower side of said last named impression cylinder.

SPRAY DAMPENER FOR LITHOGRAPHIC OFFSET PRESSES. Horace Edwin Mardsen. *U. S. Patent 2,543,663. Official Gazette* 643, No. 4, February 27, 1951, Page 1310. In a lithographic offset printing press having a printing cylinder and a printing plate carried thereby, a dampening device for spraying atomized water directly onto the printing plate carried by the printing cylinder, comprising in combination a block shaped member extending across the entire width of said printing plate, a first manifold embodied, lengthwise within said block shaped member for supplying air under pressure, a second manifold embodied lengthwise in this said block shaped members parallel with said first parallel with said first manifold for the supply of water under pressure, a series of compound air and water spray jets fed from said manifolds for spraying atomized water onto said printing plate, a series of adapters for securing said compound spray jets integrally to said block shaped member, valves operating within said block shaped member regulating the supply of air and water from such manifolds to said spray jets and cam actuated means carried by said block shaped member for mechanically controlling said valves for regulating the supply of air and water under pressure to said spray jets substantially as set forth.

• MAKEREADY ON THE OFFSET PRESS. Theodore Makarius. *Modern Lithography* 19, No. 2, February, 1951, Pages 45 & 47 (2 pages). Makeready procedure is explained. Stops and guides are adjusted to compensate for paper being out of square or having bowed edges. Paper edges are smoothed if necessary. Blank sheets are run to check feeder. The plate is mounted precisely by aligning register marks with previously located marks on the plate cylinder bearer.

• A SPRAYNIPPLE MOISTURE UNIT ON THE OFFSET PRESS HAS BEEN DEVELOPED SATISFACTORILY. I. G. T. Nieuws, No. 8, April, 1951, Pages 129-130 (2 pages) in Dutch. Advantages are: 1. Better quality and consistency of the run; 2. Better and brighter color rendering; 3. Timesaving, and less wear and tear of pressparts and printing unit; 4. The spraynipple does not have to be taken off the machine at any time, is always ready to be used and easy to regulate; 5. This spray system can be mounted onto any kind of press. The workings are extensively tested and are considered valuable to the industry.

SPRAY APPARATUS FOR DAMPING THE CYLINDERS OF OFFSET PRINTING MACHINES. *British Patent 649,216.* M. Ras. *Printing Abstracts* 6, No. 3, March, 1951, Page 92. Defects inherent in spray devices hitherto devised are claimed to be eliminated by the provision of an oblong box having a longitudinal slot, means for producing an air current through this slot which is uniformly distributed along it, and means for atomizing water and distributing it uniformly in the air current to form a spray jet of mist through the slot onto a part of the offset machine required to be damped.

•BASIC RULES FOR PRESS CARE. Charles F. Geese. *National Lithographer* 58, No. 4, April, 1951, Page 31. A brief article which the author intends as a guide to pressmen in the musts of offset printing, and also to serve as a guide to the industry in what is required in the purchase and maintenance of equipment.

* SETTING THE FOUNTAIN. Theodore Makarius. *Modern Lithography* 19, No. 3, March, 1951, Page 39. The technique of setting the ink fountain is described. Large areas on the plate with little or no image should be blocked out on the fountain. The plate is then washed off with water. The fountain is set approximately correct, then the press is turned till the ductor roller contacts the fountain roller. The width of the ductor roller mark indicates the flow of ink from the fountain. Ink is applied with the knife. Fountain keys are adjusted while getting the lay. Getting a uniform water supply to the plate is important.

*KEEP YOUR OFFSET PRESS HEALTHY. Charles W. Latham. *American Printer* 132, No. 4, April, 1951, Pages 28-30, 56-57 (5 pages). Maintenance of the offset press is described in this article. Press checkup should cover ink fountain, fountain blade, ink inductor, steel drums, plate cylinder, blanket cylinder, bearer pressure, and gears. Lubrication involves use of the proper lubricant when it should be used and the maintenance of lubricating mechanisms in operating order. Precautions to be observed in oiling are listed.

* TROUBLE AHEAD? C. O. Siebke. *Graphic Arts Monthly* 23, No. 5, May, 1951, Pages 66, 68, 70 & 134 (4 pages). The process of lubricating a press is described. Also described is a method of using short plates.

* PAPER FEEDING, GUIDING AND DELIVERY. Charles W. Latham. *American Printer* 132, No. 5, May, 1951, Pages 34, 25, 80-81 and 82 (5 pages). Press stoppages are important since besides lost time, the inking and dampening systems are upset. An understanding of the paper handling unit is therefore worthwhile. This is a description of a single sheet fed unit. The techniques of jogging, loading, and positioning the pile of paper are described. The functions and mechanics of the combers, rear suckers, holddown, front suckers, forwarding mechanism, sheet travel devices, and slowdown are described along with adjustments to be made by the operator. The operation of gripper bars, chains, grippers, chain tightening device, sheet slow-down, jogging devices and pumps is covered.

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MULTICOLOR PRINTING PRESS. Charles W. Harrold. *U. S. Patent* 2,554,904. 1. In a multicolor printing press, a series of three printing units each comprising an impression cylinder and a printing cylinder, the axis of each printing cylinder being at a higher elevation than that of the corresponding impression cylinder and the axes of the impression cylinders lying in a common horizontal plane, means in the lower part of the press for transferring sheets from one impression cylinder to the next, and platforms above said transfer means, the planes through the axes of the impression and printing cylinders of each pair of adjacent units diverging upwardly to provide a fanned-out arrangement of units. *Official Gazette* 646, No. 5, May 29, 1951, Page 1592.

* OFFSET-LITHO SECTION. Charles W. Latham. *American Printer* 132, No. 6, June, 1951, Pages 64-65 (2 pages). Streaks can be caused by a combination of (a) worn bearings, (b) improperly set bearings, and (c) too much back pressure. These streaks can be eliminated by eliminating the bump at contact of blanket and impression cylinders, which breaks ink film. This is done by increasing the squeeze pressure between bearers. Changes in size between original and print can be eliminated by checking measurements at every operation with the LTF Register Rule. Compensation has to be made in packing for the increase in image size when the plate is beat around the cylinder.

Press Cylinders and Blankets

*BLANKETS AND CYLINDERS. P. B. Mennell. *Modern Lithographer and Offset Printer* 45, No. 2, February, 1949, Pages 30 and 32 (2 pages). A description of the manufacture of rubber blankets is given, followed by a discussion of the factors causing aging and glazing of the blanket, including wrong choice of blanket wash, linseed oil, driers, petrol, excessive pressure, etc. Two methods of determining the correct packings for the cylinders is given.

* THE USE AND CARE OF OFFSET LITHOGRAPHIC BLANKETS. E. Gurin. *Lithographers Journal* 35, No. 4, July, 1950, Pages 8-9 (2 pages). The most important item in blanket care is the selection of a good wash. It should be a petroleum solvent having a boiling range of 190° to 260° F. Other important factors are discussed.

* CYLINDER PACKING — ON OFFSET PRESSES. Howard A. Pritchard. *National Lithographer* 57, No. 8, August, 1950, Pages 30-32 and 66 (4 pages). Cylinder packing has a direct bearing on lengthening of the printed image. There are several other factors which affect the length of the final print, some of which compensate for others. Cylinder packing is a means of controlling printed image size and quality and should be practiced assiduously.

METHOD OF MAKING LITHOGRAPH BLANKETS. W. G. Smith. *U. S. Patent 2,525,003. Official Gazette* 639, No. 2, October 10, 1950, Page 415. A rubber-like impression sheet is secured to a thin flexible metal backing sheet to provide a laminated blanket, the blanket pulled tautly into cylindrical form with the rubber-like impression sheet outermost to place the rubber-like sheet under tension, and the rubber-like sheet ground to even thickness while cylindrically taut.

* AN ACCURATE BLANKET THICKNESS GAUGE. Robert F. Reed and Walter J. Bublitz. *Graphic Arts Monthly* 23, No. 6, June, 1951, Pages 74, 76, 78 and 80 (4 pages). The LTF Standard Blanket Thickness Gauge is described. This gauge is superior to a machinist's micrometer since it applies the same pressure for each reading and covers a larger area. The investigations necessary in developing this gauge are described.

Gums and Etches

* CELLULOSE GUM SOLUTIONS. *Research Progress* 19, May-June, 1950, Pages 1 and 4 (2 pages). CMC can be rapidly dissolved by making a slurry of CMC and isopropyl alcohol, and adding water slowly to the slurry. This alcohol-mix etch is equal in all respects to that obtained by conventional mixing methods. Detailed instructions are given.

A SIMPLE GUM RECIPE. *Institut Voor Grafische Techniek T.N.O. Offset* 5, No. 19, September 16, 1950, Page 322 (In Dutch). Instructions are given for making up a cellulose gum from: (1) 750 cc. water; (2) 4 cc. Phosphoric acid, 85%; (3) 60 g. cellulose gum; water to make up to 1000 cc. *Printing Abstracts* 5, No. 11, November, 1950, Page 516.

Plates and Grains

GRAINING MACHINE. Bernard R. Halpern. *Official Gazette* 637, No. 4, August 22, 1950, Page 1163. A graining machine comprising a base, a graining tub, a set of three ball bearings arranged in triangular relation on said base and supporting said tub for graining movements on the base, a control frame between the tub and base mounted to slide in one direction on the base and having a sliding connection with said tub in a direction at right angles to said first direction and a rotary drive connection to said tub.

• RESEARCH ON THE OVER-HEATING OF ZINC PLATES. A. G. Arend. *Photo-Engravers Monthly* 57, No. 682, October, 1950, Pages 301-2 (2 pages). Temperatures not higher than about 250° F. are required for the burning-in of dragon's blood or etching powder, and large grains will not be produced although there are normal variations in the duration of heating at this temperature. Should, however, the temperature reach 350° F., if only for a brief period, it suffices to cnlarge the grain several times. The effect of over-heating on the etching process and methods of ensuring uniform heating are briefly discussed. *Printing Abstracts* 5, No. 12, December, 1950.

• THE STORAGE OF LITHO PLATES. E. J. Martin. *Lithographers Journal* 35, No. 12, March, 1951, Pages 7-8 (2 pages). To prepare the plate for storage the procedure is as follows: before removing it from the press, lift the dampeners, let the image take a full charge of ink, lift the form rollers, powder the ink, gum, dry, wash with Lithotine, apply asphaltum, rub down smooth, and fan dry. The platemaker should wash off the asphaltum, wet-wash the plate, rub up the image, roll up the plate, dry and inspect, powder, wash, apply etch and gum, wash out roll-up ink, apply asphaltum, and dry the plate. Racks for storage are described and the requirements for a satisfactory storage area are listed. A records system which will identify each plate, permit it to be located quickly and give information about plate condition is described.

•CONTACT ANGLES AND RADIOACTIVE MATERIALS IN LITHOGRAPHIC RESEARCH. Robert F. Reed. *Modern Lithography* 19, No. 4, April, 1951, Pages 51-53 (3 pages). The serviceability of a litho plate on the press depends largely on the degree of differentiation and permanence of the wetting preferences of the image and non-image areas. The failure of plates in printing is due almost invariably to weakness or deterioration of the water wettability of the non-image areas. Two methods for studying the formation and properties of the desensitizing layer are described. The first is the Contact Angle method which determines the angle at which water meets the surface of a plate which is slowly advancing into the water. The second method is the Tracer Technique which determines the degree of adsorption of a radio-active phosphoric acid on the plate surface. Studies are now in progress on the effect of different counter-etches, and on the factors that determine the amount of residual stencil on the image-areas of deep-etch plates.

• LITHO PLATE RESEARCH. Robert F. Reed. *Modern Lithographer and Offset Printer* 47, No. 4, April, 1951, Pages 62-65 (4 pages). The use of contact angle and radioisotope techniques for determining plate surface characteristics and composition are described. The contact angle in water of desensitised plates is practically zero for any desensitiser (gum arabic or cellulose gum). Measurements after surface treatment (Cronak or Brunak) but before desensitising showed increased wettability, compared to untreated samples, which improved final desensitisation as shown by laboratory and plant press tests. The decreased wettability caused by treatment with bichromated albumin was also eliminated by these treatments. Press tests showed the permanence of desensitisation to be greatest when wettability before etching and gumming was greatest. Attempts to determine specific surface of grained plates by using radioactive phosphorus were unsuccessful due to the impossibility of getting consistent results. A technique for studying absorbed films on plate surfaces was developed using the above.

IMPROVEMENTS IN MACHINES FOR GRAINING LITHOGRAPHIC PLATES. Charles A. Beckett, Arthur Beckett, James and Guy Hartley. *British Patent 649,390. Tin-Printer and Box-Maker* 27, No. 316, May, 1951, Page 10. A plate receiving trough has a false or true ferrous metal bottom for supporting lithographic plates, and associated loose magnets which can be distributed at intervals upon the exposed surface of the trough. The magnets, when distributed so as to contact the edges of the plates to be grained laid upon the surface, retain the plates against movements relative to the trough whilst maintaining their own fixed position due to the magnets.

Offset Duplicators

* OFFSET DUPLICATION WITHOUT A FORM DAMPENING ROLLER. C. H. Van Dusen, Jr. *Lithographers Journal* 35, No. 3, June, 1950, Page 41. A means for controlling the balance of ink and fountain solution has been developed and applied to certain models of Multilith Duplicators. This development involves automatically maintaining the balance by applying ink and fountain solution through the same train of rollers from two separate fountains. This system of applying ink and fountain solution greatly simplifies the operation of a planographic offset duplicator.

*OFFSET DUPLICATION WITHOUT A SEPARATE DAMPENING ROLLER. C. H. Van Dusen, Jr. *Modern Lithography* 19, No. 1, January, 1951, Pages 47-8 (2 pages). In the field of offset duplication the planographic offset process possesses great flexibility and produces superior copy but requires a somewhat more highly skilled operator than do other methods. A means of automatically maintaining the ink-water balance on an offset duplicator would greatly simplify the operation and much work has been done in an effort to accomplish this by using ink-fountain solution emulsions in the place of ink, but this has not been too successful. Another way of accomplishing this objective has just recently been achieved. Ink and fountain solution are fed to the form through the same train of rollers from two separate fountains. By this method, the balance is automatically maintained over a wide range of master materials, ink coverage and temperature-humidity variations. All of the rollers in the train are covered with ink but there is no apparent emulsification. It would appear that the water is present in a thin continuous film on the ink film and when the form roller contact an imaged area on the form the water is forced away and ink deposited, but when the form roller contacts an un-imaged area the surface is kept free of ink by the deposition of a film of water.

Graphic Arts—General

XEROGRAPHY TO BE USED BY U. S. A. F. TO ENLARGE MICROFILMED DRAWINGS. Centr. Air. Documents Off. Tech. Data Digest, 15, No. 3, March 1, 1950, Page 13. Xerography employs a charge of static electricity on a sensitive plate just before the plate is exposed. During exposure, electrons escape from the areas which receive light and are retained on the dark areas. Subsequently, the exposed plate is dusted with a black, resinous powder which adheres to those areas where the electrons have remained. Printing is accomplished by placing a sheet of paper in contact with the powdered plate, and then spraying the paper with electrons, whereupon the powder image is transferred from the plate to the paper. The image is then heated to fuse it to the paper. Equipment for printing microfilms of engineering drawings by the method is being tested in the Photographic Laboratory, Engineering Division, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Microfilms can be enlarged, in about a min., as much as 20 times by this process to make prints up to 22 by 34 in. in size. *Printing Abstracts* 5, No. 10, October, 1950, Page 471.

* AIR CONDITIONING: Part 8. *Modern Lithography* 18, No. 7, July, 1950, Pages 43-5 and 97 (4 pages). A description of the calculations and assumptions upon which design of the air-conditioning system is based. The design day and plant are typical of the New York area.

INDUSTRIALLY IMPORTANT AQUEOUS COATING FLUIDS. Donald B. Mutton and O. J. Schierholtz. *Can. Chem. Process Inds.* 34, 1950, Pages 643-8 (6 pages). The properties of dispersions (clear and pigmented) of soybean alpha protein, Na carboxylmethylcellulose, and polyvinyl alc. in the viscosity range of 50 to 250, centipoises are used in the manuf. of coated or "glazed" papers, wall papers, and some fancy wrapping papers. The rheological behavior of a material is important in detg. its usefulness for a certain purpose. The aq. solns. of the high-mol. org. compds. studied behave much like true Newtonian liquids over the viscosity range used in ordinary paper coating and printing work. *Chemical Abstracts* 44, No. 19, October 10, 1950, Page 9085.

*TYPE COMPOSITION HOT AND COLD. Bernard Snyder. *National Lithographer* 57, No. 11, November, 1950, Pages 30-6 (7 pages). The advantages and disadvantages of conventional (hot) typesetting and the new photo-typesetting and typewriter composing (cold) are discussed and the need for both is stressed. Article is followed by description and samples of eleven cold type composition systems including Artype, ATF - Hadego, Fototype, Lithotype, Justowriter, Linofilm, Intertype Fotosetter, Justigraphy, Vari-Typer, IBM Typewriter, Underwood Justifying Typewriter.

STATIC ELECTRICITY, ITS NATURE AND METHOD OF ELIMINATION. W. J. Appleby. *British Printer* 63, No. 375, November-December, 1950, Pages 54-6 (3 pages). The nature of static electricity and some devices used for its elimination are described. Eliminators are of two types: the radioactive, self-energizing type and the electric neutralizer. The advantages of each type are discussed, and the characteristics of some commercially available installations are outlined. 3 illustrations. *Bulletin of the Institute of Paper Chemistry* 21, No. 4, December, 1950, Page 271.

*A REVIEW OF DEVELOPMENTS . . . IN METAL DECORATING. Christian F. Scheehle, Jr., *National Lithographer* 57, No. 12, December, 1950, Pages

28-9 and 80-2 (5 pages). The history of metal decorating is reviewed. It starts with the slow coaters of the 1920's, develops through improvements in register and drying oven control, feeders, and magnets to the high speed, large sheet size coaters of today. Automatic handling equipment for the feed end, oven stripping, and stacking have been developed so the major limitation on speed today is the time required for curing coatings.

GLASS FIBRE LAMINATES IN CARTOGRAPHY. E. W. Jackson. The results are given of investigations of various materials, such as cellulose acetate film, polystyrene film, Vinylite film, wet-strength paper, and paper made with glass fibres, for their possible use in making maps and charts. None of these was found to be satisfactory, but it was demonstrated that a dimensionally reliable white sheet, suitable for cartagraphic purposes, can be produced on a laboratory scale by bonding together several layers of fine-mesh woven glass fabric with a suitable cross-linking transparent resin. When polystyrene is used for this purpose, the resulting laminate has excellent properties, except for an inherent greasiness; this difficulty may be eliminated by rubbing the surface with cotton wool moistened with a dilute solution of gelatine and Teepol. The tendency of the material to be distorted by mild heating can be overcome only by modifying the photographic process to eliminate heating. Diallyl phthalate laminates were found to be very satisfactory with regard to dimensional stability, absorption of ink and ability to withstand heat. *Printing Abstracts* 5, No. 12, December, 1950, Page 555.

ALUMINIUM SUPPORTS FOR PHOTOGRAPHIC EMULSIONS. B. F. Terry. *U. S. Patent 2,494,729.* Commercial sheet aluminium contains foreign metal impurities in its surface which, when used as emulsion support, cause spots and defects apparently due to gas development by reaction with the processing solutions. The difficulties can be avoided by treating the sheets prior to coating with a 6% solution of disodium phosphate at 80-95°C. for at least ten minutes followed by rinsing with hot water. *Printing Abstracts,* Part 1, 1951, Page 27.

METHOD OF TREATING ALUMINIUM SURFACE. R. B. Mason. *U. S. Patent 2,507,314.* A uniform matte surface is formed on aluminium by alternate treatment in a solution of an alkali metal fluoride and a solution of a suitable strong acid. The treatment may be repeated four or more times, the surface becoming progressively more rough. *Printing Abstracts,* Part 1, 1951, Page 27.

*MAKING WORK EASIER PAYS OFF. Charles A. Conrard. *Printing Magazine* 75, No. 1, January, 1951, Pages 60-3 (4 pages). The mechanics of applying a work simplification program are described. Management strives to mold the attitude of its employes toward itself, about productivity, the job, equipment, and to the program by overcoming antagonism and convincing the employes that their suggestions are of value; and that greater productivity means improved standard of living. A series of "Morgensen" meetings is held to train key supervisory personnel in the program. The program is suitable for smaller plants also.

*PLASTIC COATED PAPERS. Ralph T. Nazzaro. *American Printer* 132, No. 1, January, 1951, Pages 30-1 and 59 (3 pages). Some of the plastics used and methods of applying are described. Methods used are emulsion coatings, solvent coatings, hot melt coatings, and organosols and plastisols. The properties produced by coatings and the fields of application are discussed.

* REPORT ON: A SURVEY OF EYE EFFICENCY. Dr. J. A. Beiman. *National Lithographer* 58, No. 1, January, 1951, Pages 32-3 (2 pages). A program of visual skill testing is being used by the I. S. Berlin Press to assure the most effective use of labor and material. Production has increased and absenteeism dropped by changing the seeing pattern of the less efficient men to that of the more efficient or by changing the individual's job to one he is more suited for visually.

* SILK SCREEN PROCESS — ITS RELATION TO LITHOGRAPHY. Herbert O. Sperry. *National Lithographer* 58, No. 2, February, 1951, Pages 28-9 and 88-90 (5 pages). The value of using the silk screen process in addition to lithography is discussed. It is suitable for short runs, large sheets, rush orders, and unusual materials not capable of being economically run by lithography. By using both processes, a complete campaign can be sold diversifying the products and reducing fear of competition. A Screen Processor can correct errors to salvage jobs and use "Day-Glo" colors which are not available now in lithographic ink form.

* WHEN PRINT FADES. Andre Page. Paper and Print 24, No. 1, Spring, 1951, Page 56. Causes of fading of printed matter other than exposure to sunlight are described. They are atmospheric conditions (smoke, soot, and chemical vapors), certain components of adhesives and mordants (chlorides, acids, and alkalis), and paper impurities (sulphur dioxide, alkalis, and acids). The ideal solution to the problem would be to mount all print on "neutral" boards, use adhesive free of harmful acids or alkalis, and varnish the surface as a protective measure.

* BICHROMATE DERMATITIS. Robert G. Patterson. *American Photo-Engraver* 43, No. 4, April, 1951, Pages 359-60 (2 pages). Bichromate dermatitis is caused by absorption of chromium compounds through the skin. For self treatment, application of a 5% aqueous solution of sodium penta thionate is recommended. Method of using involves four steps: (1) wash with castile soap, (2) swab with 3% hydrogen peroxide, (3) dry swab on sodium thionate solution for one minute, (4) apply either olive oil or lanolin.

* FLUORESCENT INKS AND PAINTS. T. Thorne Baker. *Modern Lithographer and Offset Printer* 47, No. 5, May, 1951, Pages 88-90 (3 pages). This article is an abstract of a lecture explaining the chemistry of fluorescence. It explains the reason for the necessity of using a thicker ink film with Day-Glo inks than is practical with letterpress and offset, and the limitations in color which are dictated by the dyes.

* EFFECTIVE PLANT LAYOUT. Mel Magnuson. *Modern Lithography* 19, No. 5, May, 1951, Pages 34-37 & 105, 107 (6 pages). The factors to consider when making the layout for a plant are discussed. The steps in applying these factors are: 1. Make a scale drawing of the present building; 2. Prepare an overall process chart; 3. Prepare a flow chart of materials going through the production process; 4. Plan general aisle arrangements to give easy access to each department and so that the flow of materials moves in the same general direction; 5. Tabulate the amount of floor space for each department; 6. Summarize the present equipment by department along with sizes and space required; 7. Summarize storage facilities and handling methods; 8. Investigate possible improvements in processes and methods. Other things to consider are kind of construction and air conditioning.

* EFFECTIVE PLANT LAYOUT (Part Two). Mel Magnuson. *Modern Lithography* 19, No. 6, June, 1951, Pages 65 and 67 (2 pages). Equipment necessary for making a new layout is a table, templates for each piece of equipment, graph paper to cover the table, strips of colored paper to indicate aisles and storage areas, and stick pins for columns. Procedure to be followed: 1. Study department layouts and special requirements; 2. Study the basic flow of materials and operations; 3. Determine from above, the relative positions of departments; 4. Establish an aisle arrangement; 5. Develop work station layouts for individual production centers; 6. Arrange departments requiring certain natural features first; 7. Draw up the layout to be blueprinted with details in place.

Processes — General

EVAPOROGRAPHY. Alexander Murray. *U. S. Patent 2,503,759. Official Gazette* 633, No. 2, April 11, 1950, Page 549. The method of printing which comprises coating onto a two-tone negative image formed of a material which absorbs infrared radiation and converts it to heat, a layer of ink which contains a pigment and which is not fluid enough to flow around, at least part of which ink is volatile enough to volatilize under infrared radiation and is fusible and transferable when fusing, uniformly radiating the coated negative with infrared radiation of sufficient intensity and for sufficient time to evaporate all of the volatile and fusible part of the ink from the areas of the coating overlying the infrared absorbing areas of the image without removing it from the other areas of the image, placing a final print support to which the ink will transfer and fuse without hurting the support, in contact with the remaining ink layer, heating the contacting layers to fuse the ink in said other areas into the support to form a positive image therein and removing the negative and all unfused ink from the support.

* PHOTO GELATINE PRINTING: COLLOTYPE. H. H. Lerner, *PSA Journal Annual*, 1950, Pages 617-19 (3 pages). The introduction of the direct rotary press in the U. S. A. has made European collotype obsolete. The U. S. Process also possesses the following further advantages: 1. The Vertical Coater which yieldsmore uniform plate coatings. 2. Water purifying systems such as ionic exchangers. 3. The superiority of American gelatine. 4. Precision atmospheric control such as air-conditioning and humidity regulators. 5. Improved printing inks. 6. Research and advances in photographic techniques such as masking methods and superior photographic materials and equipment of great variety to suit every job. *Printing Abstracts* 5, No. 7, July, 1950, Page 342.

* LEARN TO HANDLE THAT SPRAY GUN. Al Reynolds. *Share Your Knowledge Review* 31, No. 10, August, 1950, Pages 12-14 (3 pages). When setting up and adjusting a non-offset gun for efficient operating, certain fundamental factors should be kept in mind. These factors are as follows: (1) Height of gun, (2) Amount of spray material, (3) Amount of air, (4) Shape of spray, (5) Duration of spray and (6) Particle size of spray.

*"DRY" OFFSET METHODS. Olin E. Freedman. *Photo-Engravers Bulletin* 40, No. 4, November, 1950, Pages 84-90 (7 pages). The advantages of dry offset (relief offset) over letterpress, lithography, and intaglio are listed. Those concerned with lithography are: color is more uniform since ink and water don't have to be balanced, emulsification of ink is eliminated, moisture pick up by stock is eliminated, plates may be changed on the press in sections along the length of the plate cylinder, and presswork is simpler. Disadvantages are: screen sizes are limited, ink choice is limited, and plate cost is higher.

* SILK SCREEN TECHNIQUE. F. W. MacKenzie. *Paper and Print* 23, No. 4, Winter, 1950, Pages 421-23 (3 pages). In the production of decals, the silk screen process is challenging lithography in certain specialized applications. The silk screen process provides a heavier printed film and is now mechanized. The Simplex, Sandwich, Double-sided, and Duplex methods of making transfers are described. Use of silk screen with letter press or lithography is mentioned. Production problems are drying of heavy films and obtaining suitable resolution.

METHOD OF MAKING INTAGLIO OR GRAVURE PRINTING PLATES. William H. Falconer and Louis Calder Estler. *Official Gazette* 641, No. 1, December 5, 1950, Pages 187-8. *U. S. Patent* 2,532,701. A two-exposure method of making a resist for intaglio etching by means of a single structured positive transparency having transparent portions and opaque portions of uniform density so arranged that in each part of the picture the tone of the original is represented by the ratio between opaque area and transparent area on that part of the transparency and the darkest tone is represented by substantially separate opaque dots, which comprises assembling said transparency and a carbon tissue with a transparent spacer between them, and making two successive exposures of the carbon tissue through the structural transparency and the spacer, one with direct light which casts a sharp shadow of the dots of the structured transparency upon the carbon tissue and the other with diffused light which cuts under the dots of the structured transparency and casts a blurred shadow of them upon the carbon tissue.

* DRY OFFSET. Olin E. Freedman. *Modern Lithography* 18, No. 12, December, 1950, Pages 34-6 and 97, 99 (5 pages). After a brief sketch of the three most important modes of printing there is a point by point appraisal of dry offset, advantages, disadvantages and uses.

* A NEW MAP REPRODUCTION DEVICE. *Share Your Knowledge Review* 32, No. 6, March, 1951, Pages 25-26 (2 pages). A Spirit Duplicator replacing the Gelatin Duplicator has been developed for producing multi-colored maps, etc. Alcohol is used to transfer the image directly from a master copy to the paper instead of using water on an image containing gelatin pad. The negative necessary for spirit duplication is made by backing up the master paper with process carbon paper when typing, writing or drawing. More copies can be made from one master with the Spirit Duplicator and climatic variations have less effect.

* COMMENTS ON COLLOTYPE. R. B. Fishenden. *Modern Lithographer and Offset Printer* 47, No. 3, March, 1951, Pages 44-46 (3 pages). A review of the collotype process and when it can be satisfactorily used — for short editions where its cost compares favorably to letterpress or litho.

REGISTER CONTROL AND SIGNAL FOR WEB PRESSES. Emory W. Worthington and George J. Schowerer. *U. S. Patent 2,550,318. Official Gazette* 645, No. 4, April 24, 1951, Page 1272. Register control mechanism for web presses and the like driven through differential gearing including a shaft which introduces corrective movement into the differential gearing for running register, said shaft serving to correct the register of two presses or the like operating on a moving single continuous web, a control device for causing rotation of said shaft when desired, and means responsive to the actual resulting rotation of said shaft for causing a signal which may be used as an approximate measure of the amount of register correction being introduced by the control device.

* DRY OFFSET PRINTING HAS ADVANTAGES FOR CONVERTERS. Nelson E. Funk. *Share Your Knowledge Review* 32, No. 7, April, 1951,

Pages 22-24 (3 pages). The basic principle of dry offset is the transfer of ink from a plate etched in relief to a rubber blanket which transfers it to the paper. The dry offset plate is made by coating a magnesium plate with cold top, exposing, developing, powdering, and etching. A plate .032" thick etched to a depth of .010" to .012" produces the best results.

METHOD OF PRINTING AND DEVELOPING SOLVENT IMAGES. Chester F. Carlson. *U. S. Patent 2,551,582. Official Gazette* 646, No. 2, May 8, 1951, Page 420. The process which comprises producing an electrostatic latent image on a layer of insulating material, electrostatically depositing a fine liquid mist consisting of volatile material on said image to produce a liquid image, transferring the liquid image to a copy surface by pressing said surface against the liquid image and then bringing said copy surface into contact with a coloring material to pick up said coloring material on said liquid image.

FUSION PHOTOTHERMOGRAPHY. Alexander Murray. *U. S. Patent 2,552,209. Official Gazette* 646, No. 2, May 8, 1951, Page 589. The method of printing which comprises inking up with fusible ink at a temperature above the melting point of the ink which is above 100° F., an intaglio printing plate having at least 50 elemental areas per linear inch and having in each element a series of cavities of various sizes from a minimum to a maximum, bringing the plate to a temperature just below said melting point to solidify the ink in the cavities, placing a final print support in contact with the inked surface of the plate, irradiating the inked surface with a continuous tone negative image of the print to be made with sufficient intensity and for sufficient time to melt the ink in all of the cavities in the elemental areas at points of minimum intensity in the negative image and at points of medium intensity of the negative image to melt the ink in a number of the cavities beginning with the minimum size one, the number and the size of the largest one melted being proportional to the intensity of the negative image in that element, and removing the final print support with the fused image therein from the surface of the printing plate.

* SILK SCREEN GOES MECHANIZED. Robert Foster. *American Printer* 132, No. 6, June, 1951, Pages 46-47 and 62 (3 pages). Along with improvements in mechanization of the silk screen press have come improved inks, stencils, stencil frames, and drying equipment. New synthetic resin inks will dry, with forced ventilation, in 12 minutes, heat or infrared dryers can eliminate racks and further reduce drying to 45 to 60 seconds. Photographic film screens are replacing the handcut film stencils. Silk screen machines can now print from 450 to 1200 impressions per hour. The Screen Process Printing Association has done much for the industry.

HEAT SENSITIVE PRINTING ELEMENT AND METHOD. *U. S. Patent 2,556,550.* Alexander Murray. *Official Gazette* 647, No. 2, June 12, 1951, Page 523. The method of reproducing a picture which comprises filling with ink a line of juxtaposed capillary orifices in a solid block, each connected to a fluid-filled cell, the cells also being in line, illuminating a line of a negative of the picture in printing relation to the line of cells, exposing the cells by light from the line of the negative to heat the cells thereby causing expansion of the fluid and emission of ink from the orifices, receiving the emitted ink on an ink receptive support, and periodically replenishing the capillary orifices with ink while synchronously scanning the negative by the line which exposes the cells and the support by the line of orifices.

Research and Development

NEW METHOD GIVES PRECISE CONTROL IN AIR CONDITIONING. *Chemical Engineering* 57, No. 7, November, 1950, Page 200. Describes controlled humidity method which is a system of air conditioning giving complete control of temperature and relative humidity, holding constant conditions or varying them at the will of the user. It provides dry air at normal atmospheric temperatures with little or no refrigeration required. Claims that a condition of 15 grains of moisture per pound of air at 85° F. normal temperature has been produced without refrigeration. Flow diagram and description shown. Claims some of the equipment may be used for winter air conditioning when required. *ANPA Research Bulletin* 40, February 9, 1951.

* RESEARCH AND DEVELOPMENT. John K. Rasmussen. *Modern Lithography* 18, No. 12, December, 1950, Pages 47-9 (3 pages). The metal decorating industry has been able to overcome several problems brought about by recent developments in the food and drug industry. By means of special tests on standard coatings and labels they have been able to adopt these coatings for use on the new products. As a means of controlling color the G. E. recording spectrophotometer has been used extensively. The introduction of the poly-metallic litho plates has produced longer printing runs. Each of the three types of poly-metallic plates has its advantages and disadvantages.

* DEVELOPMENTS IN THE GRAPHIC ARTS—1949-1950. Robert H. Simmons. *Tappi* 33, No. 12, December, 1950, Pages 30a, 32a, 34a, 38a, 40a, 42a, 44a, (7 pages). A summary of the developments which took place in paper, inks, color, photographic illumination, air conditioning, drying, static eliminators, printing presses, printing plates and equipment, photography, resins and chemicals, adhesives, instruments, photocomposing, and miscellaneous subjects is given.

Testing and Measurement

* GLOSS MEASUREMENT. V. G. W. Harrison. *Paint Manufacturer* 20, No. 8, August, 1950, Pages 277-79 and 293 (4 pages). A number of methods for measuring gloss are described. The Ingersoll Glarimeter is described. This instrument is dependent upon the fact that the light reflected from a non-metallic surface is plane polarized to an extent governed by the surface finish of the specimen. A more satisfactory method of gloss assessment is to measure the intensity of the light reflected at the specular angle. The effect of surface irregularities upon visual assessments of gloss are discussed. When comparing two papers with equal glossmeter readings, the paper with the more irregular surface is generally downgraded by the visual observer.

*MEASURING THE PRINTING QUALITY OF NEWSPRINT. G. Larocque, B. Axelrod, S. Clark. *Pulp and Paper Magazine of Canada* 52, No. 3, Convention, 1951, Pages 166-174 (9 pages). Improved testing equipment and a recommended standard procedure are described whereby newsprint is printed on a proof press under specified conditions of inking, impression, etc. so as to duplicate the appearance which would be obtained with commercial plates and ink on a regular newspaper press . . . Such a method has the advantage over conventional paper tests (e.g. smoothness, softness, formation, porosity, etc.) in that it measures printing quality directly as such. Since the conditions which newsprint is called upon to meet in commercial operation vary, depending up-

on circumstances, the details of this testing procedure have been selected so as to represent the more exacting ones which newsprint must meet in actual commercial practice. Using this test procedure, the differences in appearance between newsprints are the same as those which would be observed were the papers printed in the pressroom. This test procedure can be used: 1. To show up differences in paper quality from one mill to another; 2. To compare the effect of varying operating conditions at the same mill; 3. to establish whether a falling-off in the appearance of a newspaper can be attributed to pressroom circumstances or to a deficiency in the paper itself. The quality of the printing can either be appraised visually or, if required, expressed as a number through the use of a conventional reflectance meter. The value which is obtained has been called the "Per Cent Printing Quality" of the paper. On such a scale, the better newsprints tests about 83 per cent and the poorer ones 69 per cent, a difference of 14 per cent. Since a difference of 0.4 per cent is readily discernible to the eye, this represents some 35 "least perceptible differences" or distinct steps between the better and poorer papers. It is suggested that this procedure be used to supplement existing tests in order to assist mill operators in determining what effect changes in furnish and other variables may have upon printing quality, and to permit the production of the best possible grade of newsprint within the practical limitations of wood supply, equipment and other handicaps which every mill must face. Although intended primarily for testing conventional newsprint, the procedure can also be used for evaluating the effect of new and original techniques of manufacture such as coating or supercalendering newsprint.

CORROSION RESISTANCE OF HARD-CHROME COATINGS. H. W. Dettner. *Metalloberflaeche*, Vol. 4, 1950, Pages 33-7 (5 pages). This article covers comprehensive research that was undertaken to establish whether the corrosion resistance of hard chrome deposits increases or decreases at lower temperatures and current densities. For every corrosion medium tested, 75 samples were plated in a hard chrome bath of composition 250 gm./1. of CrO_3 with 1% H_2SO_4 at a temperature range of 30 to 70°C., and with current densities of 20 to 80 amsp./sq. dm., so that for each bath temperature and current density, a considerable number of test pieces were examined. It was found that the corrosion resistance of hard chrome coatings obtained under varying conditions of plating is not uniform. Hard chrome coatings show a minimum of corrosion resistance to acid medii and sea water at bath temperatures between 45° and 53°C. The corrosion resistance improves both when the bath temperature is raised and lowered outside this range. The influence of the current density is as follows: at bath temperatures above the range given, the corrosion resistance is improved by decreasing the current density. Hard chrome coatings show considerable resistance to alkaline attack. The reason for this behaviour lies in the varying corrosion resistance of modification of the chromium which mainly occurs, which is the face space-centered chromium and the corrosion resistant hexagonal B chromium. *Metal Finishing* 49, No. 1, January, 1951.

*ELECTRONIC HYGROMETER TO MEASURE AND CONTROL MOISTURE IN AIR. *Industrial Equipment News* 19, No. 1, January, 1951, Page 1. The Minneapolis-Honeywell Regulator Company announces an electronic hygrometer consisting of gold leaf electrodes in the shape of combs, interlocked and mounted in plastic. A thin coating of chemical salts covers the electrodes, the current passing thru the salts changing with moisture content of the air. The equipment gives relative humidity direct without the need for psychrometric charts.

* THE MEASUREMENT OF RELATIVE HUMIDITY. *Graphic Arts Monthly* 23, No. 2, February, 1951, Pages 50 & 52 (2 pages). Three methods of measuring relative humidity and their advantages are described. They are: (1) wet and dry bulb, (2) membrane and filament, and (3) electric hygrometers.

Tone and Color

* COLOR: ITS MEASUREMENT AND CONTROL. *Graphic Arts Monthly* 22, No. 7, July, 1950, Pages 68, 70 and 72 (3 pages). The reasons for variations in color on the printed sheet are discussed. The passing of a press proof has been, up to now, a matter of individual judgment. The advantages of a machine in evaluating colors are that it has a "memory" for color that the human eye lacks and it can measure the amount of difference with a high degree of precision. Different types of instruments are discussed notably physical and psychological types. Research is being performed by LTF in this field using instrument control with the promise of being able to help hold colors constant, thereby keeping customers happier.

* POSSIBILITIES AND LIMITATIONS IN TONE REPRODUCTION. Paul W. Dorst. *Modern Lithography* 19, No. 5, May, 1951, Pages 45-48 & 53 (5 pages). Perfect tone reproduction is seldom realized. The over-all limitations in tone are determined by the paper and the ink applied to it. In an effort to compensate for these limitations, tone reproduction curves, density of original versus density of the reproduction, are charted. From a study of such curves a decision can be reached as to the best way to compensate for the difference in tone ranges of the original and reproduction.

* THE THEORY OF MOIRE PATTERNS. Dr. Daniel Tollenaar, *Modern Lithography* 18, No. 7, July, 1950, Pages 41-2 (2 pages). The mathematical treatment of the moire pattern problem is elementary because all the patterns are approached with one general formula. Three most common patterns are squares, rosettes, and the pattern formed by making a halftone from screened copy. Let K be the distance between the moire bands, d the distance of screen spacing and a the angle of the screen. Then K can be calculated from:

$$K = \frac{d_1 \, d_2}{\sqrt{d_1^2 + d_2^2 + d_1 \, d_2 \cos a}}$$

FLUORESCENT LAMP ARTIFICIAL DAYLIGHT UNITS FOR COLOUR MATCHING. G. T. Winch, W. Harrison, and H. R. Ruff. *Trans. Illum. Tngng. Society*, London, 1951, 16, No. 1, Pages 1-12. The colour and colour rendering characteristics of natural daylight are considered, together with the requirements for artificial daylight sources for critical color matching purposes. The development of artificial daylight units utilizing tubular fluorescent electric discharge lamps is shown to follow two main lines: (1) a combination of fluorescent powders in either cold or hot cathode fluorescent lamps, and (2) a combination of radiation from fluorescent lamps and groups of incandescent tungsten filament lamps. Practical tubular fluorescent daylight colour matching units using cold cathode tubes are in use in industry for critical colour matching purposes, whilst experimental hot cathode lamps have been used in some prolonged field tests. An alternative method being investigated is to combine blue fluorescent lamps with incandescent tungsten filament lamps. This provides a closer approximation to black body spectral distribution than at present possible with fluorescent lamps alone, pro-

vided care is taken to ensure adequate mixing of the light, and adjustment is made for the differential life behavior of the component lamps. The outstanding advantage of artificial daylight units incorporating tubular fluorescent lamps is their high efficiency (of the order of 30 lm/w.) which enables a very much higher illumination to be obtained over large working areas than has previously been practicable with filtered tungsten light or light from daylight units incorporating carbon dioxide tubes. *Printing Abstracts* 6, No. 3, March, 1951. Page 108.

* ACCURATE COLOR CONTROL. Charles F. King. *Inland Printer* 125, No. 4, July, 1950, Pages 40-3 (4 pages). There is as yet no completely satisfactory color measuring instrument available, but greater accuracy of control can be obtained with present instruments than that relying upon visual examination.

Foundation Publications

SKILLED CRAFT TEXTS

501 Lithographic Offset Press Troubles
502 Offset Platemaking (albumin)
503 Offset Photography—(Line)
504 Offset Platemaking (Deep Etch Gum Process)
505,6 Lithographic Offset Press Operating, 2 Volumes
507 Offset Stripping (Black and White)
508 Offset Photography (Halftone)
509 Offset Photography (Color Separation)
510 Tone and Color Correcting (Dot Etching)
511 Tone and Color Correcting (Hand Retouching)
513 Lithographic Press Technical
514 Tone and Color Correcting (Opaquing)

SHOP MANUALS

101 Paper and Humidity in the Pressroom
103 Albumin Platemaking
104 pH Control of Fountain Solutions
105 Inking System for the Offset Press
107 Feeder and Delivery for Offset Presses
108 The Dampening System of Offset Press
109 Guides, Grippers and Insertion Devices
111 Offset Plates in the Pressroom
112 Offset Photography (Line)
114 Packing and Pressures for Presses
115 Press Cylinders for Offset Lithography
116 Offset Photography (Color Separation)
117 Hand Transfers for Offset Lithography
118 Press Troubles for Offset Lithography
119 Gauges and Instruments for Offset
120 Photo-Composing for Offset Lithography
121 Tone and Color Correcting (Retouching)
122 Proving for Offset Lithography
123 Platemaking for Offset (Deep Etch)
124 Offset Photography (Halftone)
125 Paper for Offset Lithography

Publications

126 Paper Conditioning for Offset Lithography
127 Pressroom Problems
131 Plate Troubles in Offset Lithography
133 Paper Troubles in Offset Lithography

SPECIAL SUBJECT TEXTS

403,4 Chemistry for Lithographers, 2 Volumes
407 Survey of Lithography
410 Estimating (Black and White)
411 Estimating (Color)
413 Leadership Training

RESEARCH AND TECHNICAL PUBLICATIONS

206 The Albumin Process of Photolithography
211 Dot-Etching on Dry Plates and Films
212 Litho-Kleen, Improved Treatment for Blankets and Rollers
213 The Drying of Lithographic Ink
214 Improvements in Deep-Etch Platemaking
215 Sensitivity Guide
217 The Standardization of Graining Procedures
301 Modern Paper Conditioning Methods and Paper Hygroscope
303 Method of Conditioning Paper for Multi-Color Offset
304 Optical Density as a Measure of Tone Value in Lithography
305 Dot Area, Dot Density, and Tone Value
306 Prevention of Occupational Dermatitis (Chrome Poisoning)
307 Curling of Lithographic Papers
308 What the Lithographer Should Know About Paper
309 Air Conditioning for Lithographers
318 The Measurement of Offset Blanket Thickness
647,8,9,50 Lithographic Abstracts (Annually from 1947)
701 The Control of Tone Reproduction in Lithography
702 Reproduction of Tones by Offset Lithography
801 How to Make and Run Better Plates
802 Plate Surface Treatments
803 pH, What it is, How to Measure it, Where to Use it
904 The Register Rule
SB1 The Paper Hygroscope